CLASS 7 [CHEMISTRY]

Ch-3 Elements, Compounds and Mixtures

Exercise-I (Answers)

Question 1

Helium-He,	Silver-Ag,	Krypton-Kr,	Antimony-S	b, Barium-Ba
Question 2				
Na-Sodium,	C-Carbon,	Kr-krypton, U-uranium,		Ra-Radium,
Fe-Iron,	Co-Cobalt			

Question 3

- a) Elements-An element is a pure substance that cannot be converted into anything simpler than itself by any physical or chemical process. Each element has its own unique properties.
- b) Compounds-A compound is a pure substance formed by the chemical combination of two or more elements in a fixed ratio by mass. They can be broken down into simpler substances by only chemical means.

Question 4

- a) Haemoglobin----iron
- b) Chalk-----calcium
- c) Chlorophyll-----magnesium
- d) Chocolate wrappers-aluminium

Question 5

Four examples of non-metallic elements are: Hydrogen, oxygen, nitrogen, carbon.

Question 6

- a) Metalloids-These elements show some properties of metals and some properties of non-metals. They are hard solids. Example: Boron, silicon.
- b) Noble gases- These elements do not react chemically with other elements or compounds. They are found in air in traces. Example: Xenon, radon.

Question 7

Elements-Iron, copper, aluminium, carbon, uranium, silver

Compounds-plaster of paris, chalk, common salt, calcium oxide, cane sugar, silica, sodium sulphate, potassium carbonate, carbon dioxide.

Exercise-II

Question 1

Compounds	Mixtures		
1) When two or more elements unite	1)When two or more elements or		
chemically, a Compound is formed	compounds or both are mixed together,		
	such that they don't combine chemically,		
	a Mixture is formed		
2) Compounds are always	2) Mixtures can be homogeneous or		
homogeneous	heterogeneous		
3) In compounds, constituents are	3) In mixtures, constituents can be in		
always in fixed ratio by weight.	any ratio.		
4) The properties of a compound are	4) The constituents of mixture retain		
entirely different from the properties	their individual chemical and physical		
of its constituents.	properties		

Question 2

Pure substance : Pure substances have a definite set of properties such as boiling point, melting point, density, etc. They are all homogeneous i.e., their composition is uniform throughout the bulk. Both elements and compounds are pure substances. Pure substances are needed to :

- 1. Manufacture medicines.
- 2. To prepare chemicals in industry.
- 3. For scientific purposes.
- 4. To maintain the good health of human beings.

Question 3

- a) sand and sugar, sand and stone
- b) sand and water, charcoal in water
- c) oil and water, alcohol and water

Question 4

a) Evaporation: Is the process of converting a liquid into its vapours state either by exposing it to air or by heating.

- b) Filtration: The process of separating solid particles from liquid by allowing it to pass through a filter paper is called filtration.
- c) Sublimation : The process in which a solid changes directly into its vapours on heating is called sublimation.
- d) Distillation : Distillation is the method of getting a pure liquid from a solution by evaporating and then condensing the vapours.
- e) Miscible liquids : Liquids which dissolve in each other completely in all proportions are called miscible liquids.
- **f**) Immiscible liquids : : Liquids which do not dissolve in each other completely in all proportions are called immiscible liquids.

Question 5

- a) Magnetic separation, iron is a magnetic substance.
- b) Sublimation, ammonium chloride is sublimable in nature.
- c) Evaporation, water is lost in form of vapours into the atmosphere and salt is left behind.
- d) Winnowing separates chaff (lighter) from heavier grains in two different heaps.
- e) Mustard oil and water is liquid-liquid immiscible mixture and is separated by separating funnel. Water being the heavier forms the lower layer.
- f) By crystallization, in this process of converting a liquid into its vapour state by heating. Liquid is heated and water evaporate and sugar is obtained.
- g) Centrifugation, here the high density particles settle at the bottom and the light solid particles float on the liquid.

Question 6

Camphor with sublimation. Chalk powder with filtration then the residual left is common salt.

Question 7

The advantage of distillation is that both components of the solid and liquid mixture are obtained. Whereas in evaporation only solid is obtained.

Question 8

(a) The process of separating different dissolved constituents of a mixture by their adsorption on an appropriate material is called chromatography.

- (b) It is named so, because earlier it was used to separate mixtures containing coloured components only but these days this technique is applied to colourless substances too.
- (c) Advantages of chromatography :
 - (i) A very small quantity of the substance can be separated.
 - (ii) Components with very similar physical and chemical properties can be separated.
 - (iii) It identifies the different constituents of a mixture.
 - (iv) It also helps in quantitative estimation of components of a mixture.
- (d) The simplest type of chromatography is "Paper chromatography".
- (e) Chromatography is based on differential affinities of compounds towards two phases i.e. stationary and mobile phase.
- (f) The filter paper acts as "stationary phase" while the solvent act as "mobile phase".

Question 9

- (a) Sublimation: Change of solid into vapours directly on heating and change of vapours into solid again on cooling. Here one of the component is sublimable.E.g: Salt from ammonium chloride.
- (b) Filtration : The process of separating insoluble solid particles from a liquid by allowing it to pass through a filter is called Alteration. These filter s allow liquids to pass through them but not solids. The insoluble solid left on the filter is called the residue, while the liquid which passes through the filter is called the filtrate. Mixtures like chalk and water, clay and water, tea and tea leaves, sawdust and water, etc., are separated by this method.
- (c) Sedimentation and decantation : The settling down of suspended, insoluble, heavy, solid particles in a solid- liquid mixture when left undisturbed is called sedimentation.

The solid which settles at the bottom is called sediment while the clear liquid above it is called supernatant liquid.

The process of pouring out the clear liquid, without disturbing the sediment, is called decantation.

Example : A mixture of sand and water

(d) Solvent extraction method : This method is used when one of the solid components is soluble in a liquid.

Example : A mixture of sand and salt can be separated by this method. Salt gets dissolved in water while sand settles down in the container. The salt solution is then decanted. Salt is separated from the solution by evaporation. In this way, they can be separated.

- (e) Magnetic separation : This method is used when one of the components of the mixture is a magnetic substance. Iron gets attracted towards a magnet and hence can be separated. Mixtures of iron and sulphur, iron and sand, etc., can be separated by moving a magnet over them. Iron gets attached to the magnet and is separated.
- (f) By using a separating funnel : It is a simple device used to separate the components of a liquid-liquid heterogeneous mixture, having different densities.

Example : Kerosene oil and water. The mixture is placed in a separating funnel and allowed to stand for some time. The components form two clear layers. Water being heavier forms the lower layer and oil being lighter forms the upper layer. When the stopper of the funnel is opened, the heavier liquid trickles out slowly and is collected in a vessel. The stopper is closed when the bottom layer is entirely removed the funnel. In this way, the two liquids are separated.

(g) Fractional distillation : The process of distillation is used for separating the components of a homogeneous liquid-liquid mixture, like water and alcohol. This is based on the fact that alcohol boils at a lower temperature than water. The vapour of alcohol are collected and cooled while water is left behind in the original vessel. Thus two liquids have different boiling points can be separated by distillation provided that difference in their boiling point must be 25°C or more.

OBJECTIVE TYPE QUESTIONS

Question 1

- a) **<u>Elements</u>** are made up of same kind of atoms.
- b) **<u>Elements</u>** and <u>**compounds**</u> are pure substances.
- c) In a **<u>mixture</u>** the substances are not combined chemically.

- d) Clay is separated from water by the method called **loading and decantation.**
- e) <u>Crystallisation</u> is a process to obtain a very pure form of a solid dissolved in a liquid.
- f) Camphor and ammonium chloride can **<u>sublimate</u>**.

Question 2.

- a) The solid particles which remain on the filter paper after the filtration **residue.**
- b) The liquid which evaporates and then condenses during the process of distillation <u>distillate.</u>
- c) The process of transferring the clean liquid after the solid settles at the bottom of the container <u>decantation.</u>
- d) The process by which two miscible liquids are separated <u>fractional</u> <u>distillation.</u>

MULTIPLE CHOICE QUESTIONS

- 1. (b) distillation
- 2. (d) fractional distillation
- 3. (a) tap water
- 4. (a) stationary phase
- 5. (a) ink, honey, ice-cream, milk

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