SUBJECT : CHEMISTRY

CLASS : VIII

UNIT 3 : *ELEMENTS, COMPOUNDS AND MIXTURES*

* ***OBJECTIVE EVALUATION***:

A. CHOOSE THE CORRECT ANSWER:

1. The correct method of separation of proteins from urine is

a. diffusion b. **centrifugation**

c. chromatography d. decantation

2. The method of obtaining both the solute and solvent from a homogeneous solution is

a. diffusion b. evaporation

c. **distillation** d. crystallization

3. The method of separation of iodine from potassium iodide is

a. sedimentation b. **sublimation**

c. distillation d. diffusion

4. Which of the following properties would be true when two elements combine to form a compound?

a. components are present in fixed proportion

b. components can be separated by chemical means only.

c. components particles are of one kind only.
d. **All the above**.

5. Which of the following methods are used for separating a solid-solid mixture?
a. **solvent extraction** b. sedimentation
c. Diffusion d. centrifugation

B. FILL IN THE BLANKS :

1. Benzene and toluene can be separated by fractional distillation.
2. Greasy spots on a cloth can be separated by solvent separation.
3. Mixture of sodium chloride and ammonium chloride can be separated by sublimation.
4. Water and alcohol can be separated by fractional distillation.
5. Cellulose of paper is the stationary phase and adsorbent surface while a suitable solvent act as the mobile phase in the separation of pigments of ink by the process of chromatography.

C. NAME THE TECHNIQUE ADOPTED TO SEPARATE :

1. Carbon dioxide and water.

Ans. Boiling or heating

2. Kerosene oil and water.

Ans. Separating funnel

3. Iron and sulphur.

Ans. Magnetic separation

4. Copper and sulphur.

Ans. Solvent separation

5. Sodium chloride and sugar.

Ans. Fractional crystallisation

6. Salt and water.

Ans. Evaporation

7. Calcium carbonate and sodium chloride.

Ans. Solvent separation or solvent extraction

* SUBJECTIVE EVALUATION

D. ANSWER THE FOLLOWING QUESTIONS :

Q 1. *Write down the characteristics of the elementary particles of matter.*

Ans. Matter is made up of elementary particles like atoms, molecules ,radicals and ions.

1. **ATOM**: An atom is the smallest particle and can take part in a chemical reaction.

2. **MOLECULE** : A molecule is made up of one or more atoms of same or different types.

3. **RADICAL** : A radical is a charged particle made up of a group of atoms behaving as a unit.
4. **ION** : An ion is a charged particle made from a single atom.

Q2. *Name two methods with one example in each case for separation of :*

Ans.

a. **SOLID-SOLID MIXTURE**:

1. Magnetic separation.

Eg: Separation of iron and copper fillings.

2. Sublimation.

Eg: Separation of iodine from sand.

b. SOLID-LIQUID MIXTURES:

1. Filtration.

Eg: Separation of chalk powder from water.

2. Distillation.

Eg: Separation of pure water from impure water.

c. LIQUID-LIQUID MIXTURES:

1. Fractional distillation.

Eg: Separation of petrol from crude oil.

2. Separating funnel.

Eg: Heavier water from oil.

Q3. *Name a water soluble and one water insoluble.*

Ans.

	WATER SOLUBLE	**WATER INSOLUBLE**
1) Sulphate	Zinc sulphate	Calcium sulphate
2) Chloride	Calcium chloride	Silver chloride
3) Carbonate	Sodium carbonate	Calcium carbonate
4) Hydroxide	Sodium hydroxide	Aluminium hydroxide

Q4. *State the principles of separation of mixtures by the following methods*:

Ans.

a. **SOLVENT EXTRACTION** : If one of the components of the mixture is soluble and the other insoluble, a suitable solvent is used to dissolve the soluble component. The insoluble component is filtered out. Then the soluble component can be obtained by evaporation of the solvent.

b. **FRACTIONAL CRYSTALLISATION** : Two soluble substances in the same solvent can be separated from their supersaturated solution by formation of crystals at different times by the virtue of different solubility level of the two substances at a particular temperature. The different substances form crystals at different temperatures.

c. **FRACTIONAL DISTILLATION** : Two miscible liquid components of a mixture are separated in a distillation flask with a fractioning column using difference in their boiling points.

d. **PAPER CHROMATOGRAPHY** : Chromatography is the separation of the solid components of a complex mixture by the virtue of differential rate of movement of various molecules along an adsorbent surface called the stationary phase carried along or pumped through by a solvent called the mobile phase in a definite direction.

e. **DISTILLATION**: In this method the soluble solid component of a solution is separated from its liquid component by evaporation followed by condensation of the evaporated liquid from its vapour separately. Thus, the solute and the solvent both are obtained by this method.

f. **CENTRIFUGATION**: Centrifugation is a method used to separate minute insoluble suspended particles from a suspension on application of centrifugal force upon the particles by rotating the suspension in a closed container at a very high speed. The denser components of the suspension migrates away from the axis of rotation while the less dense component migrates towards the axis.

Q5. *Differentiate between H_1, H_2 and H^+. Define the terms you have stated.*

Ans. H_1 is the single atom of hydrogen.

H_2 is the molecule of hydrogen.

H^+ is an ion.

1) **ATOM**: An atom is the smallest particle and can take part in a chemical reaction.

2) **MOLECULE**: A molecule is made up of one or more atoms of same or different types.

3) **ION**: An ion is charged particle made from a single atom.

Q6. *Give four characteristics of a compound*.

Ans. Four characteristics of a compound are:

1) Compounds can be broken down into constituent elements by chemical means.

2) Compounds have a specific set of properties of their own which are distinct from the properties of the constituent elements.

3) Number of compounds formed by the combination of the known elements is practically endless.

4) A compound is represented using formula.

Q7. *Write down four characteristics of a mixture*.

Ans. Four characteristics of a mixture are:

1) The constituent elements or compounds of a mixture may be present in varying proportions.
2) Each constituent substance retains its own properties in a mixture.
3) The constituents can be separated by easy physical means.
4) Mixtures may be homogeneous or heterogeneous.

Q8. *Why do we need to separate the components of a mixture?*
Ans. We need to separate the components of a mixture in order to:
1) Get useful substances like minerals, petrol, etc.
2) Get completely pure substances like water, metals, etc.
3) Remove certain unwanted or harmful substances from a mixture.

Q9. ***Define the following terms***:
a) **FILTRATION**: It is the method used for separation of insoluble solid component from a liquid component of a mixture using a porous filter.

b) **EVAPORATION**: The process of separation of a non-volatile soluble solid in a solution is known as evaporation.

c) **DIFFUSION**: Diffusion is the process of movement of particles of a substance from a region of high concentration to a region of low concentration.

d) **SOLUTION**: A homogeneous mixture of two or more, chemically unreactive substances in varied proportion is called a solution.

e) **CRYSTALLISATION**: Crystallisation is the process of separation of a soluble solid in the form of crystals from its hot supersaturated solution by cooling.

f) **CHROMATOGRAPHY**: Chromatography is the process of separation of the components of a complex mixture by the help of a solvent moving along an adsorbent surface.

g) **WINNOWING**: Winnowing is the method adopted for separation of a much heavier component from a lighter component.

h) **SEDIMENTATION**: It is the method of separating insoluble solid particles from a liquid by allowing the solid particles to settle down at the bottom of vessel.

EXTRA OBJECTIVES:

- ***NAME THE FOLLOWING***:

1) Name the method used to separate minute insoluble suspended particles from a suspension on application of centrifugal force.
Ans. Centrifugation

2) Name the heavy insoluble solid particles that settle down during the process of sedimentation.
Ans. Sediment

3) Name the process of separation of components of a complex mixture by the help of a solvent moving along an absorbent surface.
Ans. Chromatography

4) Name the method used to separate miscible liquids.
Ans. Fractional distillation

5) Name two methods of separating solid-solid mixture by the virtue of difference in the size of particles.
Ans. Handpicking and sieving

6) Name the substance added during the process of loading.
Ans. Alum

- **MATCHING:(DIRECT ANSWERS)**

1) Homogeneous mixture -- Sugar solution
2) Heterogeneous mixture -- Muddy water
3) Loading -- Alum
4) Iron fillings and copper -- Magnetic separation
5) Iodine and sand -- Sublimation
6) Petrol and crude oil -- Fractional distillation
7) Water and oil -- Separating funnel

* ***TRUE OR FALSE***:

1) Ions are charged particles derived from a single atom. ***TRUE***
2) Alloys are solid-solid homogeneous solution. ***TRUE***
3) Elements and compounds are impure substances. ***FALSE***
4) Mixture is a pure substance. ***FALSE***
5) Muddy water is a homogeneous mixture. ***FALSE***
6) Salt solution is a homogeneous mixture. ***TRUE***
7) Air is a homogeneous mixture. ***TRUE***
8) The component present in greater quantity is called solvent. ***TRUE***
9) There are 118 known elements on the earth. ***TRUE***
10) Filtration is the method used for separating soluble solid components from liquid. ***FALSE***

*****GIVE REASON***:

1) Why do we add alum during the process of sedimentation?

Ans. We add alum during the process of sedimentation because alum particles stick to the suspended solid particles and form heavy substance which speeds up the process of sedimentation.

2) Why different methods of separation are needed to separate the components of different types of mixture?

Ans. Different methods are needed to separate the components of different types of mixture because different components of different mixture have different characteristic properties.

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