# 3 PURE SUBSTANCES AND MIXTURES

**I. Tick (✓) the most appropriate answer.**

**1.** The constituents of a mixture are present in :
(a) a fixed ratio (b) any ratio
(c) the ratio of 4 : 1 (d) none of the above

**2.** Pure water is obtained from sea water by the process of
(a) filtration (b) distillation (c) centrifugation (d) decantation

**3.** Small particles of sand in river water are removed by the process of
(a) decantation (b) evaporation (c) filtration (d) cyrstallisation

**4.** A mixture of clay in water is an example of a/an
(a) heterogeneous mixture (b) homogeneous mixture
(c) emulsion (d) none of these

**5.** When a mixture is formed
(a) a physical change takes place (b) a chemical change takes place
(c) both physical and chemical changes take place
(d) none of the above

**6.** During distillation, the pure liquid collected is called
(a) sublimate (b) distillate (c) filtrate (d) none of the above

**7.** Dry common salt can be obtained from its solution, by the process of
(a) decantation (b) winnowing (c) evaporation (d) centrifugation

**8.** Elements are
(a) mixtures (b) pure substances
(c) liquids (d) none of the above

**9.** Solutions are
(a) heterogeneous mixtures (b) homogeneous mixtures
(c) compounds (d) elements

**10.** In a solution, the molecules of the dissolved solid are called
(a) solvent (b) solute (c) filtrate (d) sediment

**11.** The method of separating components of a given mixture depends upon
(a) properties of the components (b) shape of the components
(c) state of the components (d) none of the above

**12.** Fractional distillation is used to separate
(a) solids from solids (b) solids from liquids
(c) liquids from liquids (d) none of the above

**13.** A mixture of chalk powder and water is a
(a) solution (b) emulsion (c) suspension (d) compound

**14.** Different coloured dyes can be separated from ink by
(a) filtration (b) decantation
(c) paper chromatography (d) crystallisation

**15.** Loading is a process in which
(a) impurities float on the top
(b) impurities become heavy and sink to the bottom
(c) impurities vaporise (d) none of the above

**16.** During filtration the substance left behind on the filter paper is called
(a) residue (b) filtrate (c) solution (d) impurity

**17.** Which of the following is a homogeneous mixture?
(a) An oil-water mixture (b) A sand-water mixture
(c) Mist (d) A nitrogen-oxygen-mixture

**18.** Which of the following is a heterogeneous mixture?
(a) A salt-pepper mixture (b) A fizzy drink
(c) A salt solution (d) Air

**19.** Which of the following is an alloy?
(a) Iron (b) Gold (c) Steel (d) Copper

**20.** Which of the following methods would you use for separating pulse seeds from rice?
(a) Filtration (b) Sublimation (c) Distillation (d) Handpicking

**21.** Which of the following methods would you use for separating iron from sulphur particles?
(a) Magnetic separation (b) Filtration
(c) Sublimation (d) Distillation

**22.** A pure liquid is obtained from a solution by
(a) evaporation (b) crystallisation (c) filtration (d) distillation

**23.** The process of adding a chemical substance to help the suspended solid particles in a liquid to form a sediment is called
(a) loading (b) sedimentation (c) decantation (d) filtration

**24.** Salt is separated from sea water by
(a) evaporation (b) sublimation (c) crystallisation (d) filtration

**25.** A heterogeneous mixture is
(a) made up of only one kind of molecule
(b) made up of different kinds of atoms and molecules

(c) made up of only one kind of atoms
(d) a solid-liquid mixture

**Ans.** **1.** (b) **2.** (b) **3.** (c) **4.** (a) **5.** (a) **6.** (b) **7.** (c) **8.** (b) **9.** (a) **10.** (b) **11.** (a) **12.** (c) **13.** (c) **14.** (c) **15.** (b) **16.** (a) **17.** (d) **18.** (a) **19.** (c) **20.** (d) **21.** (a) **22.** (d) **23.** (a) **24.** (a) **25.** (b).

**II. Fill in the blanks:**

**1.** A pure substance has a ..... ratio of its constituents.
**2.** A liquid is separated from an insoluble solid by ..... .
**3.** Centrifuge is an apparatus that rotates at a ..... speed.
**4.** To separate two miscible liquids with varying boiling points ..... is used.
**5.** A mixture of oil and water is an ..... .
**6.** Impurities of water are loaded with ..... to make them sink to the bottom.
**7.** Suspensions and emulsions are ..... mixtures.
**8.** ..... is used to separate mixture on the basis of colours.
**9.** Immiscible liquids are separated by using a ..... .
**10.** ..... process is used to separate metals from their ores.
**11.** Cream is separated from milk by ..... .
**12.** A mixture of water and alcohol is separated by ..... .
**13.** Mist is a ..... mixture of droplets of water and air.
**14.** An alloy is a ..... mixture of metals and non-metals.
**15.** When cereals are washed before cooking, water is separated from the cereals by ..... .
**16.** ..... is a process used to obtain a very pure form of a solid dissolved in a liquid.
**17.** Camphor is separated from common salt by the process of ..... .
**18.** The solid particles which remain on the filter paper are called ..... and the liquid which passes through it is called ..... .

**Ans.** **1.** constant **2.** filtration **3.** very high **4.** fractional distilation **5.** immiscible mixture **6.** alum **7.** heterogeneous **8.** Chromatography **9.** separating funnel **10.** Froth flotation **11.** centrifugation **12.** fractional distillation **13.** heterogenous **14.** homogeneous **15.** decantation **16.** Crystallisation **17.** sublimation **18.** residue, filtrate.

**III. [A] Fill in the blank spaces by choosing the correct words from the following list.**

**List:** distillation, same, iron, sedimentation, iodine, decantation, ammonium chloride, outward, alloy, filtration

**1.** Particles of ..... are separated by a magnet from a mixture of iron and sulphur.

**2.** Substances like ..... and ..... can be removed from a mixture by the process of sublimation.

**3.** Pure water can be obtained from common salt solution by the process of ..... .

**4.** ..... and ..... are processes followed in removing insoluble impurities from river water for city water supply system.

**5.** All pure substances contain the ..... particles or groups of particles.

**6.** In a centrifuge, the heavier particles in a suspension are pushed ..... .

**7.** The insoluble substance left on the filter paper after ..... is called a precipitate.

**8.** A homogeneous mixture of two or more metals on cooling forms an ..... .

**Ans. 1.** iron **2.** ammonium chloride, iodine **3.** distillation **4.** sedimentation, decantation **5.** same **6.** outward **7.** filtration **8.** alloy.

**[B] 1.** The constituents of a mixture are present in ..... proportion (any/fixed).

**2.** The constituents of a mixture ..... their properties (retain/do not retain).

**3.** The constituents of a mixture ..... be separated by physical means (can/cannot).

**4.** Water containing dissolved air is a ..... mixture (gaseous/gas-liquid).

**5.** An alloy is a homogeneous ..... (solid mixture/gas mixture).

**Ans. 1.** any **2.** retain **3.** can **4.** gas-liquid **5.** solid mixture.

**IV. Statements given below are incorrect. Write the correct statements.**

**1.** Husk is removed from grains by the process of handpicking.

**Ans.** Husk is removed from grains by the process of winnowing.

**2.** Cheese is removed from curdled milk by the process of decantation.
**Ans.** Cheese is removed from curdled milk by the process of filtration.
**3.** Sulphur is removed from a mixture of iron and sulphur by winnowing.
**Ans.** Sulphur is removed from a mixture of iron and sulphur by a bar magnet.
**4.** Pure water is obtained from sea water by the combined process of decantation and filtration.
**Ans.** Pure water is obtained from sea water by the process of distillation.
**5.** When muddy water is filtered, the mud collects as a precipitate.
**Ans.** When muddy water is filtered, the mud collects as a residue.
**6.** The constituents of a mixture are present in a fixed ratio.
**Ans.** The constituents of a mixture are present in any ratio.
**7.** Salt and sulphur can be separated by dissolving in alcohol.
**Ans.** Salt and sulphur can be separated by dissolving in water.
**8.** When milk is centrifuged, the heavier cream settles at the base.
**Ans.** When milk is centrifuged, the lighter cream floats on the heavier contents of milk.
**9.** Iodine can be separated from a mixture of iodine and sand by the process of evaporation.
**Ans.** Iodine can be separated from a mixture of iodine and sand by the process of sublimation.

**V. State whether the following statements are true or false.**

**1.** Pure substance is a homogeneous material which contains particles of one kind only.
**2.** Sugar solution is a heterogeneous mixture.
**3.** The process of obtaining soluble salt from a solution is called evaporation.
**4.** Pure water can be obtained from sea water by the process of filtration.
**5.** An alloy is a homogeneous mixture of two or more molten metals.
**6.** Sulphur can be obtained from a mixture of iron and sulphur by the process of distillation.
**7.** The constituents of a mixture are present in a fixed ratio.
**8.** No chemical reaction takes place among the constituents of a mixture.
**9.** The constituents of a mixture retain their original properties.
**10.** Heterogeneous mixtures have uniform composition.
**11.** Salt and sugar can be separated by dissolving them in ethanol.

**12.** Soluble solid substances can easily be separated from their solvents by distillation.
**13.** Black coffee is a pure substance.
**14.** The constituent of a mixture chemically react with one another.
**15.** Mist is a homogeneous mixture.
**16.** Winnowing is suitable for separating chaff from grains.
**17.** Distilled water is pure water.
**18.** Pure substance is a homogeneous material which contains particles of one kind only.
**19.** Salt solution is a heterogeneous mixture.
**20.** The process of removing soluble salt from a solution is called evaporation.
**21.** Pure water can be obtained from sea water by the process of filtration.
**22.** Sulphur can be obtained from a mixture of iron and sulphur by the process of sublimation.
**23.** Kerosene oil can be obtained from a mixture of kerosene and water by using a separating funnel.
**24.** Iodine and ammonium chloride sublime on heating.
**25.** Common salt is separated from its solution in water by decantation.
**26.** Winnowing is a process used to remove small stones from grains.
**27.** Gold is a homogeneous mixture of metals.
**28.** Air can be separated from water by filtration.

**Ans.** **1.** T **2.** F **3.** T **4.** F **5.** T **6.** F **7.** F **8.** T **9.** T **10.** F **11.** F **12.** T **13.** F **14.** F **15.** T **16.** T **17.** T **18.** T **19.** F **20.** T **21.** F **22.** F **23.** T **24.** T **25.** F **26.** F **27.** F **28.** F.

**VI. (a) Match the statements in Column A with those in Column B.**

| *Column A* | *Column B* |
|---|---|
| **1.** A substance obtained by mixing two or more pure substances. | **a.** Sublimate |
| **2.** A clear liquid obtained by the process of filtration. | **b.** Decantation |
| **3.** Removing the husk from grain by farmers. | **c.** Mixture |
| **4.** Removing insoluble impurities from muddy water by allowing it to settle down. | **d.** Distillate |
| **5.** A pure liquid obtained from its salt solution. | **e.** Winnowing |
| **6.** A solid obtained from its hot vapour. | **f.** Filtrate |

**Ans.** **1.** (c) **2.** (f) **3.** (e) **4.** (b) **5.** (d) **6.** (a).

**(b)**

| *Column A* | *Column B* |
|---|---|
| **1.** Crystallisation | **a.** high-speed rotation |
| **2.** Distillation | **b.** particles are allowed to settle down slowly |
| **3.** Evaporation | **c.** saturated solution is cooled |
| **4.** Loading | **d.** the liquid evaporates |
| **5.** Centrifugation | **e.** weighing down of solid particles by using alum |
| **6.** Sedimentation | **f.** involves condensing the vapour |

**Ans.** **1.** (c) **2.** (f) **3.** (d) **4.** (e) **5.** (a) **6.** (b).

**(c)**

| *Column A* | *Column B* |
|---|---|
| **1.** A chalk-water mixture | **a.** A gaseous mixture |
| **2.** A glucose solution | **b.** A solid-gas mixture |
| **3.** A fizzy drink | **c.** A homogeneous solid-liquid mixture |
| **4.** Smoke | **d.** A heterogeneous solid-liquid mixture |
| **5.** Air | **e.** A gas-liquid mixture |

**Ans.** **1.** (d) **2.** (c) **3.** (e) **4.** (b) **5.** (a).

**VII. Give reasons for the following.**

**1.** Water cannot be used to separate salt and sugar.

**Ans.** We cannot use water to separate salt and sugar because both of these substances are soluble in water.

**2.** Pure substances are required for manufacturing chemicals and other man-made materials.

**Ans.** Pure substances are required for manufacturing chemicals and other man-made materials because impurities in these substances react with each other and form other substances.

**3.** Iodine and sand can be separated by sublimation.

**Ans.** A mixture of iodine and sand can be separated by sublimation because iodine sublimes on heating, and escapes as vapour, these vapour deposit on the walls of the funnel on cooling and sand is left behind.

**4.** Suspended impurities in water sink to the bottom on adding alum.

**Ans.** Alum is added in water to settle sand and clay particles. Alum dissolves in water and load or weigh down clay and dust particles making them heavier and increasing the rate of sedimentation.

**5.** Seawater is salty.

**Ans.** Seawater is salty due to the presence of common salt.

**6.** Why are the constituents of a mixture easier to separate?

**Ans.** It is easy to separate the constituents of a mixture because these constituents are not combined chemically.

**7.** Why is distilled water tasteless?

**Ans.** Distilled water is tasteless because it does not contain dissolved salts.

**8.** Why is it necessary to separate the constituents of a mixture?

**Ans.** It is necessary to separate the constituents of a mixture to remove undesirable and harmful substances and to get useful substances.

**9.** Why do petrol and water form a heterogeneous mixture?

**Ans.** Petrol and water are not uniformly distributed through out their volume and form a heterogenous mixture. The mixture can be easily separated by using a separating funnel.

## VIII. Find the odd one out. Give a reason for your answer.

**1.** Winnowing, decantation, filtration and distillation.

**Ans.** **Winnowing** is the separation of the constituents of a solid-solid mixture while decantation, filtration and distillation are the processes used to separate solid constituents from a liquid-solid mixtures.

**2.** Air, water, common salt and lime.

**Ans.** **Air** is a mixture while water, common salt and lime are compounds.

**3.** Salt solution, milk, fruit juice and alcohol.

**Ans.** **Alcohol** is a pure substance while salt solution, milk, fruit juice are mixtures.

**4.** Distillate, precipitate, filtrate and filter paper.

**Ans.** **Filter paper** is used in the process of filtration while distillate, precipitate and filtrate are the products of the separating processes.

**5.** Handpicking, winnowing, sieving, magnetic separation, fractional distillation, sublimation.

**Ans.** **Fractional distillation** is the method used to separate two miscible liquids having different boiling points while others are methods used to separate solid constituents from heterogeneous mixtures.

**6.** Filtration, evaporation, loading, crystallisation, sieving

**Ans.** **Sieving** is the process used to separate a solid constituent from a solid-solid mixture while filtration, evaporation, loading and crystallisation are the processes used to separate a solid constituent from a liquid-solid mixture.

**7.** Solutions, compounds, suspensions, emulsions

**Ans.** **Compounds** are the pure forms of substances while solutions, suspensions and emulsions are the forms of mixtures.

**8.** Soil, air, sea water, table salt, milk

**Ans.** **Table salt** is a compound (pure substance) while soil, air and milk are mixtures (impure substances).

**9.** Paper chromatography, centrifugation, evaporation, sedimentation.

**Ans.** During **evaporation** the liquid constituent of the mixture is lost to the atmosphere while in the other processes both the solid and the liquid constituents are obtained.

## IX. Answer the following questions

**1.** (i) What do you understand by the terms
(a) pure substance (b) mixture?
(ii) Name four substances which are pure substances, but are:
(a) elements and (b) compounds.

**Ans.** (i) (a) **Pure substance.** A pure substance is a homogeneous material that contains particles of one kind and has a definite set of properties. All elements and compounds are called pure substances.

(b) **Mixture.** If two or more substances are mixed together in any proportion and they do not undergo any chemical change and retain their individual properties, then this resulting mass is called a mixture.

(ii) (a) **Elements.** Carbon, sulphur, iron, phosphorous

(b) **Compounds.** Sodium chloride (NaCl)
Sodium carbonate ($Na_2CO_3$)
Sulphur dioxide ($SO_2$)
Ferrous sulphide (FeS)

**2.** Identify pure substances and mixtures from the following list:

(i) solid common salt (ii) milk
(iii) air (iv) oxygen
(v) fruit juice (vi) brass
(vii) copper sulphate crystals (viii) distilled water
(ix) sugar solution (x) washing soda
(xi) honey (xii) ammonium chloride
(xiii) calcium carbonate

**Ans.** **Pure substances.** Solid common salt, oxygen, distilled water, washing soda, ammonium chloride, copper sulphate crystals, calcium carbonate.

**Mixtures.** Milk, air, fruit juice, brass, sugar solution, honey.

**3.** By giving one example for each, define:

(i) Heterogeneous mixture (ii) Homogeneous mixture.

**Ans.** (i) **Heterogeneous mixture.** A mixture in which the constituents are not distributed uniformly is called a heterogeneous mixture. For example, a mixture of sand and charcoal.

(ii) **Homogeneous mixture.** A mixture in which the constituents are distributed uniformly is called a homogeneous mixture. For example, a mixture of salt and water.

**4.** State four characteristics of a mixture.

**Ans.** **Characteristics of a mixture:**

(i) Mixtures have no fixed composition.

(ii) The constituents of a mixture do not bind chemically. So, there is no energy change.

(iii) The constituents of a mixture can be separated by simple methods.

(iv) A mixture may be homogeneous or heterogeneous.

**5.** Identify:

(i) Homogeneous mixture and

(ii) Heterogeneous mixture from the following list:

(a) common salt solution (b) a mixture of sand and salt

(c) milk (d) brass

(e) gun powder (a mixture of nitre, charcoal and sulphur)

(f) chocolate bar and

(g) cooked vegetable of peas and cauliflower.

**Ans.** (i) **Homogeneous mixture.** Common salt solution, milk, brass, chocolate bar.

(ii) **Heterogeneous mixture.** A mixture of sand and salt, gunpowder (mixture of nitre, charcoal, and sulphur), cooked vegetables of pea and cauliflower.

**6.** By giving two reasons prove that a powder containing iron and sulphur is a mixture, but iron sulphide is a compound.

**Ans.** Powder containing iron and sulphur is a mixture because:

(i) The constituents of this powdercan be mixed in any ratio.

(ii) The constituents of this powder can be separated by physical means.

Iron sulphide is a compound because:

(i) The constituents of iron sulphide are present in a definite ratio.

(ii) Both the constituents of this compound bind each other by chemical force.

**7.** By giving two reasons, prove that :

(i) air is a mixture and (ii) water is a compound.

**Ans.** (i) Air is a mixture because of the following reasons:

(1) Air consists of several gases such as oxygen, nitrogen, carbon dioxide and water vapour which retain their individual properties.

(2) Composition of air changes from one place to another. For example, near big industries it contains large amount of carbon dioxide and nitrogen. At high altitudes such as mountains, it contains less amount of oxygen.

(ii) Water is a compound because of the following reasons:

(1) Water contains hydrogen and oxygen in the ratio of 1 : 8 by weight. It means that it is homogeneous in nature.

(2) We cannot separate the constituents of water by physical means.

**8.** Give four important differences between a mixture and a compound.

**Ans.**

| Mixture | Compound |
|---|---|
| (i) They are composed of two or more elements mixed together in any proportion and do not combine chemically. | (i) They are composed of two or more elements which are combined together chemically in a fixed proportion. |
| (ii) Mixtures may be homogeneous or heterogeneous. | (ii) Compounds are always homogeneous. |
| (iii) The constituents of a mixture retain their individual properties. | (iii) The properties of a compound are entirely different from the properties of its constituents. |
| (iv) No energy change takes place, during the formation of a mixture. | (iv) Energy change takes place during the formation of a compound. |

**9.** What do you understand by the following terms?
(i) Sedimentation (ii) Sediment (iii) Supernatant liquid
(iv) Decantation (v) Centrifugation (vi) Distillation (vii) Distillate

**Ans.** (i) **Sedimentation.** It is the process of settling down of suspended, insoluble, heavy solid particles in a solid-liquid mixture.

(ii) **Sediment.** When a solid-liquid mixture is allowed to stand for some time then the heavier solid particles settle down at the bottom of the vessel. The solid which settles down at the bottom is called sediment.

(iii) **Supernatant liquid.** When a solid-liquid mixture is allowed to stand for some time then the heavier solid particles settle down at the bottom of the vessel. The clear liquid which remains above is called the supernatant liquid.

(iv) **Decantation.** The process of pouring out the clear liquid without disturbing the sediment, is called decantation.

(v) **Centrifugation.** The method used to separate fine suspended particles in a liquid by whirling the liquid at very high speed is called centrifugation. For example, cream is separated from milk by the process of centrifugation.

(vi) **Distillation.** The process of separation of a liquid from a solution by evaporation followed by recondensation of its vapours in another vessel is called distillation.

(vii) **Distillate.** In the process of distillation, the pure liquid obtained by boiling the solution and condensation of its vapours is known as distilled liquid or distillate.

**10.** What do you understand by the following terms?
(i) Filtration (ii) residue or precipitate (iii) filtrate

**Ans.** (i) **Filtration.** The process of separation of insoluble solid constituents of a mixture from the liquid constituents by passing it through a suitable porous material, is called filtration. For example, tea leaves are separated from brewed tea by using a strainer.

(ii) **Residue.** The insoluble solid constituents of a solid-liquid mixture which is left on the filtering material (such as a strainer) is called residue.

(iii) **Filtrate.** The liquid constituent of a solid-liquid mixture which pass through the filter is called the filtrate.

**11.** How would you separate the components of the following mixtures?

(i) Powdered glass and sugar (ii) Chalk powder and iron filings
(iii) Chaff and grain (iv) Water and palm oil

**Ans.** (i) The mixture of powdered glass and sugar can be separated by using a solvent. Sugar dissolves in water while glass powder does not. The mixture is filtered to separate glass powder and the solution is evaporated. Sugar is obtained as the residue.

(ii) A mixture of chalk powder and iron filings can be separated by using a magnet. Iron filings get attached to the magnet and are separated.

(iii) Chaff and grains are separated by the process of winnowing. Chaff is very light as compared to the grains. The wind carries the chaff forward and the grains fall vertically downward. Thus, we get two heaps — one of grains and the other of chaff.

(iv) The mixture of water and palm oil is separated by using a simple device called a separating funnel. Water is heavier than palm oil. So it forms the lower layer. By opening the tap of the funnel, the heavier liquid runs out and is collected in a vessel. In this way, water is separated from palm oil.

**12.** How would you separate sawdust, common salt and sand from a mixture of the three?

**Ans.** Take the mixture of sand, sawdust and common salt. Transfer it in a beaker of water. Now allow it to stand for sometime. We see that salt dissolves in water, sand particles settle down at the bottom of the beaker while saw dust floats on the surface of water. Saw dust is filtered and separated without disturbing the sand. Now stir the water with a glass rod and allow it to stand for some time. Sand settles down. Decant the water carefully and dry the sand. Now heat the salt solution. Water evaporates, leaving behind the salt.

**13.** Which technique is used to separate the following mixture?

(i) An insoluble substance in a liquid
(ii) A solid in a solution
(iii) A liquid in a solution

**Ans.** (i) (a) **Filtration** is used for separating the components of a heterogeneous solid-liquid mixture in which the solid is lighter than the liquid.

(b) **Sedimentation and decantation** is used to separate heterogenous mixture of solid and liquid where the solid component is heavier than the liquid component.

(ii) Evaporation is the process used to separate a solid from a solution by heating the solution.

(iii) **Distillation** is the method of separation of a pure liquid from a solution.

**14.** Name any four substances which can be used as filter.

**Ans.** Charcoal, cotton, filter paper and glass wool are used as filter.

**15.** How would you separate a mixture of iron filings, sand and common salt? Explain.

**Ans.** Firstly, rub a magnet over the mixture to separate the iron filings. Now add some water and stir it with a glass rod and let it stand for some time. Now decant the water carefully and dry the sand. Now heat the salt solution when water evaporates, leaving behind salt.

**16.** The constituents of a liquid mixture of methyl alcohol and acetone are to be separated. Suggest a suitable method of separation. (Boiling point of methyl alcohol 65°C and that of acetone is 56°C.)

**Ans.** The best method of separation of a mixture of methyl alcohol and acetone is fractional distillation because methyl alcohol and acetone have different boiling points. On boiling acetone vapourises first and methyl alcohol vapourises later.

**17.** Why do we use the following?

(i) Filter paper (ii) Alum (iii) Separating funnel
(iv) Centrifuge (v) Sieve

**Ans.** (i) **Filter paper.** It is used to separate fine insoluble solid particles from a liquid.

(ii) **Alum.** It is used to load the suspended impurities in a solid-liquid mixture.

(iii) **Separating funnel.** It is used to separate two immiscible liquids from a liquid-liquid mixture.

(iv) **Centrifuge.** It is a machine which rotates at a very high speed. It is used to separate fine suspended particles in a liquid.

(v) **Sieve.** It is a wire mesh through which fine particles pass and the heavier ones remain on the sieve.

**18.** What is a pure substance?

**Ans.** A pure substance is a sample of matter, either an element or a compound, that consists of only one component with definite physical and chemical properties.

Pure substances cannot be separated by physical processes but can be separated by chemical processes.

**19.** If you kindle a mixture of 1 gm of hydrogen and 8 gm of oxygen, will you obtain a pure substance or a mixture?

**Ans.** If we kindle a mixture of 1 gm of hydrogen and 8 gm of oxygen then we will obtain a pure substance, *i.e.*, a molecule of water.

**20.** What is a mixture?

**Ans.** Mixture is an impure substance made by combining two or more different materials in any ratio without a chemical reaction. A mixture can be separated into its original components by physical means. Mixtures may be of two types : homogeneous, heterogeneous.

**21.** Pick the pure substances and mixtures from the following list:

| | | |
|---|---|---|
| (i) Air | (ii) Copper | (iii) Silver |
| (iv) Sugar solution | (v) Mud | (vi) Salt solution |
| (vii) Water | (viii) Carbon dioxide | (ix) Nitrogen |
| (x) Iron | (xi) Oxygen | (xii) Milk |

**Ans.** **Pure substances.** Copper, silver, water, carbon dioxide, nitrogen, iron, oxygen.

**Mixture.** Air, sugar solution, salt solution, milk, mud.

**22.** What are the following called?

(i) A mixture with the same composition and properties throughout.

(ii) A mixture, the different parts of which vary in composition and properties.

(iii) The solid that settles when a heterogeneous solid-liquid mixture is allowed to stand.

(iv) The liquid above the settlding solid in a heterogeneous solid-liquid mixture.

**Ans.** (i) **Homogeneous mixture** has same composition and properties throughout.

(ii) **Heterogeneous mixture** vary in composition and properties.

(iii) The solid that settles when a heterogeneous solid-liquid mixture is allowed to stand is called a **sediment.**

(iv) The liquid above the settled solid in a heterogeneous solid-liquid mixture is called a **supernatant liquid.**

**23.** Name the method used to separate pure water from a solution of salt.

**Ans.** Distillation is the method used to separate pure water from a salt solution.

**24.** Define immiscible liquid. Give an example.

**Ans.** The two liquids which do not mix with each other are said to be immiscible liquids, e.g., mixture of kerosene oil and water.

****