

Ch=3

Elements, Compounds & Mixtures
Exercise: 3(A)

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1. Define:

(a) Elements: An element is a pure substance which cannot be converted into anything simpler than itself by any physical or chemical process.

Example: Sodium, Iron, etc.

(b) Compounds: A compound is a pure substance composed of two or more elements, combined chemically in a definite proportion by mass.

Example - Water, Sodium chloride, etc.

2. Give two examples for each of the following -

(a) Metals - Sodium, Iron, etc.

(b) Non-metals - Oxygen, Nitrogen

(c) Metalloids - Germanium, Tellurium

(d) Inert gases - Helium, Neon.

3. Differentiate between:

(a) Pure substances & impure substances

Pure substances	Impure substances
(i) They have definite chemical composition.	(i) They do not have definite chemical composition.
(ii) Have definite physical & chemical properties	(ii) Do not have definite physical & chemical properties.
(iii) They are all homogenous	(iii) They can be homo- -genous or hetero- -genous.

(b) Homogenous Substances Heterogenous Substances

(i) In this type of substances the components are uniformly distributed throughout their volume

(i) In this type of substances the components are not uniformly distributed throughout their volume.

- (ii) The components cannot be seen separately. | (iii) The components can be seen separately.

4. Write the chemical name of the following and also their molecular formulae:

(a) Baking Soda \rightarrow Sodium Bicarbonate & NaHCO_3

(b) Vinegar \rightarrow Acetic acid & CH_3COOH

(c) Marble \rightarrow Calcium carbonate & CaCO_3

(d) Sand \rightarrow Silicon dioxide & SiO_2

5. Name

(a) A soft metal \rightarrow Sodium

(b) A metal which is brittle \rightarrow Zinc

(c) A non-metal which is lustrous \rightarrow Iodine

(d) A liquid metal \rightarrow Mercury

(e) A metal which is a poor conductor of electricity \rightarrow Tungsten

(f) A non-metal which is a good conductor of electricity \rightarrow Graphite.

- (g) A liquid non-metal → Bromine
- (h) The hardest naturally occurring ^{Substance} → Diamond
- (i) An inert gas → Helium

6.) How does sodium chloride differ from its constituent elements?
Explain

Ans: - Sodium chloride completely differ from its constituent elements in properties. Sodium is a soft, highly reactive metal. Chlorine is a greenish yellow gas which is poisonous. However, sodium chloride is a non-poisonous white crystalline solid which is very useful to us as it adds taste to our food.

7.) Why iron sulphide a compound?

Ans: - Iron sulphide is a compound formed when iron & sulphur combine chemically on heating, in ratio 7:4 by mass.

Iron sulphide is a black solid while iron is a grey black metal & sulphur is yellow amorphous non-metallic solid.

Iron is attracted by magnet & sulphur is soluble in carbon disulphide whereas iron sulphide is neither soluble in carbon disulphide nor attracted by magnet.

Exercise - 3 (B)

1.) Classify the following substances into compounds and ~~mixtures~~ mixtures

→ Compounds ⇒ Carbon dioxide, Water, Common Salt, iron sulphide

Mixtures ⇒ Air, Milk, Blood, Fruit juice.

2. Give one example for each of the following types of mixtures —

(a) Solid - Solid Homogeneous mixture → Brass

(b) Solid - liquid Heterogeneous mixture → Sand +

- (c) Miscible liquids \rightarrow Alcohol + Water.
(d) liquid-gas homogeneous mixture
 \rightarrow Water + Carbon dioxide.

3.) Suggest a suitable technique to separate the constituents of the following mixtures. Also give the reason for selecting the particular method.

(a) Salt from sea water.

\rightarrow Since only salt is required from the given mixture, it can be separated by evaporation.

(b) Ammonium chloride from sand.

\rightarrow Since Ammonium chloride is a sublimable substance, this mixture can be separated by sublimation.

(c) Chalk powder from Water.

\rightarrow Filtration, since chalk powder get

Stuck in the filter paper as residue allowing water to pass.

(d) Iron from sulphur.

→ Since iron is a magnetic substance so this mixture can be separated by magnetic separation.

(e) Water & Alcohol.

→ Fractional distillation, since both the liquids are miscible & have a boiling difference ^{of more} below 30°C .

(f) Sodium chloride & Potassium nitrate

→ Fractional crystallisation, since both the solids are soluble in water.

(g) Calcium carbonate & Sodium Chloride

→ Solvent extraction, since Sodium chloride is soluble in water but not Calcium carbonate.

4. (a) Define 'mixture'.

→ Mixtures:- Mixtures is a kind of matter which is formed by mixing two or more pure substances in any proportion such that they do not undergo any chemical change and retains their individual properties.

(b) Why is it necessary to separate the components of a mixture?

→ The necessity of separation of the constituents of mixtures are -

(i) To ~~remove~~ remove harmful or unwanted substances.

(ii) To obtain pure & useful substances.

(c) State four differences between compounds & mixtures.

→ Compounds

Mixtures

(i) It is a pure substance (i) It is an impure substance.

(ii) Compounds are always homogeneous (ii) ~~Compounds~~ can be homogeneous or heterogeneous

(iii) Have a definite set of physical & chemical properties (iii) Retains the properties of individual components.

(iv) Formation of compounds involves energy change. (iv) Formation of mixture does not involve any energy change.

5. (a) What is chromatography? For which type of mixture is it used?

→ The process of separation of different dissolved constituents of a mixture by their adsorption on an appropriate material is called chromatography.

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It is used for those mixtures where the components are very similar in properties.

(b) What are the advantages of chromatography?

→ The advantages of chromatography are :-

(i) A very small quantity of mixture can be separated.

(ii) Components with very similar physical & chemical properties can be separated.

(iii) It helps us to identify the different constituents of a mixture.

(c) Write two applications of chromatography.

→ Two applications of chromatography are:-

(i) Drugs from blood.

(ii) Pigments from natural colours.