

Element and Compound

1. What are Pure Substances?

Ans. A Pure Substance is one that does not have any other substances mixed with it.

Ex: Oxygen is a gas not mixed with any other gas.

2. Pure Substances are how many types?

Ans. Pure substances are two types

- a. Element
- b. Compound

3. What are Elements?

Ans. An element is a pure substance which is made up with identical atom and cannot be split into simple substances.

- Currently we know of 118 elements. Of these 92 occur in nature, while the remaining 26 are synthetic.

Ex: Iron, Gold etc.

4. Elements are how many types?

Ans. Elements are classified into four types

- a. Metals
- b. Non-metals
- c. Metalloids
- d. Inert Gas

5. What are the properties of Metals?

Ans. The properties of Metals are

- a. Metals are usually Lustrous.
- b. Metals are solid in Room temperature (Expect Mercury, which is Liquid)
- c. Most metals are Sonorous, i.e. they produce a ringing sound when struck.
- d. Most metals are Malleable and Ductile.
- e. Metals are good conductors of heat and electricity.
- f. Most metals have high melting and boiling point.

6. What are the properties of Non-metals?

Ans. The properties of Non-metals are

- a. Non-metals may be solid (Carbon), Liquid (Bromine) or Gases (Oxygen)
- b. Solid Non-metals are not lustre (Except Diamond and Graphite which are form of Carbon.)
- c. Non-metals are Non-sonorous.
- d. Non-metals are not ductile or malleable.
- e. Most non-metals have low melting and boiling points.

7. What are Metalloids?

Ans. Metalloids are the elements which show the properties of both metals and non-metals.

Ex: Boron, Silicon, Arsenic etc.

8. What are Inert Gases?

Ans. Inert gases are the elements which are not react with other elements.
Ex: Helium, Neon, Argon, Krypton, Xenon etc.

9. What are the differences between Metals and Non-Metals?

Ans.

Metals	Non-metals
Have Lustre	Do not have Lustre.
Are malleable.	Are not Malleable.
Are ductile.	Are not Ductile
Are good conductor of Heat and electricity	Bad conductor of heat and electricity.
Have high density	Have low density

10. What is the difference between Metalloids and Noble Gases?

Ans.

Metalloids	Noble Gases
These elements show the properties of both metals and non-metals	These elements exist in the gaseous state in the atmosphere.
These are chemically reactive.	These are chemically inert.
These elements are monoatomic, i.e. contain one type of atoms.	These elements are also monoatomic.

11. What is called Symbol.

Ans. A chemical symbol is a notation of one or two letters representing a chemical element.

12. What is Periodic Table?

Ans. It is a Table in which elements are arranged in increasing order of their atomic number.

13. What is atomic number

Ans. It is the number of protons or electrons in an atom of an element
Ex: Hydrogen Atom has 1 electron so its atomic number is 1.

14. What are Molecules?

Ans. Molecule is the smallest unit of an element or compound which shows all the properties of that element or compound and has independent existence.
They are divided into atoms.
They can take part in Chemical Reaction.

15. What is Atomicity?

Ans. It is the number of an element that combine together to form a molecule of that element.

16. What are monoatomic molecules?

Ans. The elements which are made up of single atoms are known as monoatomic molecules.
Ex: Sodium (Na), Magnesium (Mg), Potassium (K), Helium (He), Neon (Ne), Argon (Ar) etc.

17. Which are Diatomic Molecules?

Ans. The molecules which contains two atoms in the same type are called Diatomic Molecules.

Ex: Hydrogen (H_2), Oxygen (O_2), Chlorine (Cl_2), Nitrogen (N_2) Etc.

18. Which is Tri-atomic Molecules?

Ans. The molecules which contains three atoms in the same type are called Triatomic Molecules.

Ex: Ozone (O_3)

19. Which are Polyatomic Molecules?

Ans. The molecules which contains more than three atoms in the same type are called Triatomic Molecules.

Ex: Phosphorus (P_4).

20. What is Formula?

Ans. A formula is a short way of representing the molecule of an element or a compound.

21. What should be known to write a chemical formula?

Ans. For writing a chemical formula the following should be known

- Symbols
- The combining capacity of an element with hydrogen.

22. What is Compound?

Ans. A compound is a pure substance that consists of two or more elements chemically combined in a fixed proportion by mass.

Ex: Water (H_2O), combines with Hydrogen (H_2) and Oxygen (O_2)

Sulfuric Acid (H_2SO_4) Combines with Hydrogen (H_2) and Oxygen (O_2)

23. Write the characteristics of Compound.

Ans. The characteristics of compound are:

- Compound is formed chemically from two or more elements.**
Ex: Water is made of hydrogen and Oxygen.
- A compound is made of molecules of only one kind.**
Ex: Pure water has only water molecules
- The molecules of a compound are made up of atoms of two or more different elements that have combined in a fixed proportion.**
Ex: Carbon Di Oxide has one atom of Carbon and two atoms of Oxygen. If the proportion changes to one atom of Carbon and one atom oxygen, a different compound called Carbon Monoxide is formed.
- The elements that form a compound cannot be separated easily.**
Ex: Water cannot be split into hydrogen and oxygen by boiling it or filtering it. It can only be split by passing electricity through it.
- Energy is either absorbed or evolved when a compound is formed.**
- The properties of compound are different from those of the combining elements.**
Ex: Water is a liquid, whether hydrogen and oxygen are gases.

24. What should be known to write a chemical formula?

Ans. For writing a chemical formula the following should be known

- Symbols
- The combining capacity of an element with hydrogen.

25. What is Valency?

Ans. The combining capacity of an element is called its valency.

26. What are the differences between Element and Compound?

Ans.

Element	Compound
An element is a pure chemical substance made of same type of atom.	A compound contains atoms of different elements chemically combined together in a fixed ratio.
An element is represented using symbols.	A compound is represented using its chemical formula that represents the symbols of its constituent elements
Elements contain only one type of atom. Each atom has the same atomic number.	Compounds contain different elements.
Elements cannot be broken down into simpler substances by chemical reactions.	A compound can be separated into simpler substances by chemical methods/reactions.

27. What are the differences between Atom and Molecule?

Ans.

Factor	Atoms	Molecules
Definition	Most fundamental and smallest part that can exist of an element.	Two or more atoms chemically bonded together.
Example	Oxygen – O Phosphorus – P Sulphur – S Hydrogen – H	Oxygen – O ₂ Phosphorus – P ₄ Sulphur – S ₈ Water – H ₂ O
Structure	The smallest particle with properties of an element.	Combination of two or more atoms.
Stability	An atom may not always be stable in nature due to the presence of electrons in the outer shells.	Molecules are formed to attain stability.
Constituent Elements	Protons, Electrons & Neutrons	Two or more atoms of the same or different elements
Reactivity	Except for the noble elements, atoms of all elements showcase a certain level of reactivity.	Compared to a molecule, the level of reactivity is less as some of the valence points are filled by electrons of combined elements.

28. What is Mixture?

Ans. Mixture are impure substances made up of two or more pure substances mixed in any proportion without any chemical reaction.

29. What are the characteristics of Mixture?

Ans. The Characteristics of Mixture are:

- Components in a Mixture are Present in a varying proportion.
- Mixtures have no definite set of properties.
- Components in a mixture can be separated by physical methods.
- It does not have definite melting or boiling points.
- Mixtures can be separated into these components by using physical methods like decantation, distillation, evaporation, crystallization, sublimation and filtration.

30. What is Homogeneous Mixture?

Ans. Homogeneous Mixture are the mixtures in which two or more elements or compounds or both are uniformly distributed mixed.

Ex: Homogeneous mixture of salt and water, homogeneous mixture of alcohol and water, air, brass etc.

31. What is Heterogeneous Mixture?

Ans. Heterogeneous Mixture the mixtures in which two or more elements or compounds or both uniformly mixed,

Ex: Oil and water, sand and water, iron and sulphur etc.

32. What are the differences between Homogeneous and Heterogeneous Mixture?

Ans.

Homogeneous Mixture	Heterogeneous Mixture
Constituents are uniformly distributed	Constituents are not uniformly distributed.
The properties and composition are same throughout the mixture.	The properties and composition change throughout the mixture.
Examples: (i) Brass [Alloy of Cu + Zn] (ii) Salt solution (iii) Air	Examples: (i) Iron and sulphur (ii) Sand and water (iii) Oil and water

33. Give some example of mixtures appears homogeneous but are actually heterogeneous.

Ans. Air, Milk.

34. What is Alloy?

Ans. An alloy is a combination of metals or metals combined with one or more other elements.

Ex: Addition of Carbon and iron makes Steel.

35. What are the characteristics of Mixture?

Ans. The Characteristics of Mixture are:

- Components in a Mixture are Present in a varying proportion.
- Mixtures have no definite set of properties.
- Components in a mixture can be separated by physical methods.
- It does not have definite melting or boiling points.
- Mixtures can be separated into these components by using physical methods like decantation, distillation, evaporation, crystallization, sublimation and filtration.

36. Write the differences between compound and mixture.

Ans.

Mixture	Compound
It is not a Pure Substance	It is a pure substance
It is made up of molecules of two or more elements or compounds.	It contains molecules of a single kind
It is not formed due to chemical change.	It is formed due to chemical change.
The components are not present in fixed proportion.	The components are present in fixed proportion.
The properties of components are retained	It has properties different from the components.
The components are even be separated by simple physical methods.	The components are usually be separated only using chemical method.

37. Why the separation of components of Mixture is necessary?

Ans. The separation of components of a mixture is necessary to:

- get pure and useful substances for manufacturing other useful products.
- remove undesirable and harmful substances.

38. On which factors the separation of mixture depends?

Ans. Separation of mixture used to separate the components of a mixture depends on the following factors:

- The physical static of the components of the mixture and
- The difference in the physical properties (i.e., density and solubility, melting and boiling points, volatile nature, sublime nature, magnetic nature etc.) of the components of the mixture.

39. What is Sublimation?

Ans. The process in which a solid change into its vapour on heating is called Sublimation.

40. What is Sedimentation?

Ans. The settling down of suspended, insoluble, heavy solid particles in a solid liquid mixture when left undisturbed is called Sedimentation.

41. What is Loading?

Ans. In the process of sedimentation sometimes some small particles suspended in water do not settle. In such cases a piece of alum is added which stuck dirt particles towards it and it become heavy and settle. This method is called Loading.

42. What are Sediment and supernatant Liquid?

Ans. The solid which settles at the bottom is called Sediment and the clear liquid above it is called Supernatant Liquid.

43. What is Decantation?

Ans. The process of pouring put the clear liquid without disturbing the sediment is called Decantation.

45. Write down the methods which are used to separate the components of mixture.
Ans.

Type of Mixture	Process	Definition
Solid - Solid	Sublimation	We can separate one sublimate solid from non-sublimely Solid.
	Magnetic Separation	We can separate magnetic solid from non-magnetic solid.
	Solvent Extraction	We can separate soluble solid from an insoluble solid.
	Fractional Crystallization	This method involves the separation of two soluble solids
Solid - Liquid	Filtration	It involves the separation of insoluble solid from liquid Component
	Sedimentation and Decantation	By this method the insoluble solid is separated from liquid.
	Evaporation	Soluble solid is separated from liquid component.
	Distillation	This is the best method for separating a liquid from a solution of the soluble solid.
Liquid - Liquid	Separating Funnel	Separating funnel finds its use in separating the immiscible lighter liquid heavier liquid.
	Fractional Distillation	Mixture of two miscible liquids with different boiling points are separated by Fractional Distillation
Complex Mixture	Chromatography	It is the method to separate the various components of mixture
	Centrifugation	It is a process of separating finely suspended particles in a liquid by rotating it at a high speed in a closed container.

Short Questions

1. Currently _____ natural elements are in our world.
2. Nitrogen is a ____ atomic molecule.
3. Mixture of sand and sugar is an example of _____ mixture.
4. _____ represents short form of a molecule.
5. _____ do not react with other elements.
6. There are _____ metals in world.
7. Valency of Sulphur are _____.
8. Mixture of Salt and water is an example of _____ mixture.
9. _____ are used in semiconductor industry.
10. There are _____ non-metals are in world.
11. Iron, Chromium, Nickel and Carbon together made _____.
12. Germanium is an example of _____.
13. The proportion at which elements combines each other is called _____.
14. Inert Gases are _____ molecules.
15. Number of atoms in Ozone are _____.
16. The valency of Carbon are _____.
17. The number of atoms present in molecule are called _____.
18. Sulphur is a _____ molecule.
19. Combining capacity of an element is called _____.
20. We can separate sand from the mixture of salt and sand mixture through _____ method.
21. Valency of Magnesium is _____.
22. Components of Steel are _____ and _____.
23. _____ are impure substances made up of two or more pure substances mixed in any proportion without any chemical reaction.
24. Combination of metals or metals combined with one or more other elements are called _____.
25. We can separate iron from the mixture of Iron dust and sand through _____

- | | |
|--------------------------|-------------------------|
| 1) 92 | 18) Polyatomic |
| 2) Di | 19) Valency |
| 3) Heterogeneous | 20) Solvent extraction |
| 4) Formula | 21) 2 |
| 5) Noble Gases | 22) Iron, Carbon |
| 6) 90 | 23) Mixture |
| 7) 2,4,6 | 24) Alloy |
| 8) Homogeneous | 25) Magnetic Separation |
| 9) Silicon and Germanium | |
| 10) 12 | |
| 11) Stainless Steel | |
| 12) Metalloid | |
| 13) Combining Capacity | |
| 14) Monoatomic | |
| 15) 3 | |
| 16) 2,4 | |
| 17) Atomicity. | |