

Pure substances and mixture, Separation of Mixture

1. What are called Pure Substance?

Ans. Pure Substances are that type of substances which contain same kind of atoms and molecule and have definite set of physical and chemical properties.

Ex: Gold

2. What are called Mixture?

Ans. Two or more pure substances mixed together in any proportion such that they do not undergo any chemical change and retain their individual properties is called mixture.

Ex: Air. It is a mixture of different gases like Oxygen, Carbon Di Oxide, Nitrogen, Water Vapour etc.

3. Mixture are how many types?

Ans. Mixture are divided into two main types:

- Heterogeneous Mixture
- Homogeneous Mixture.

4. What is Heterogeneous Mixture?

Ans. A mixture in which components or constituents are not uniformly distributed throughout its volume and can be easily seen separately is called Heterogeneous mixture.

Ex: Mixture of Sand and Water.

5. What is Homogeneous Mixture?

Ans. A mixture in which its constituents are uniformly distributed throughout its volume and cannot be seen separately is called Homogeneous Mixture.

Ex: Salt Water

6. 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

7. What is Alloy?

Ans. Alloy is a homogeneous mixture of two or more materials or a metal and non-metal.

Ex: Brass: Copper + Zinc

Bronze: Copper + Tin + Zinc

8. What is Duralumin?

Ans. It is a solid mixture of metals Aluminium, Copper, Manganese and Magnesium. It is used to make Spacecraft.

9. What are the characteristics of Mixture?

Ans. The characteristics of Mixture are:

- a. A mixture consists of two or more substances mixed together without any chemical force of acting on or between them.
- b. Mixtures do not have a fixed composition.
- c. Mixture has no definite set of properties.
- d. The melting and boiling point of mixture is not fixed. It depends on the proportions of its components present in it.
- e. Compounds in mixture can be separated by simple physical method
- f. Formation of mixture does not involve any energy exchange.
- g. Mixture can be Heterogeneous or Homogeneous.
- h. The constituents of the mixture are loosely held so they can be easily separated by simple physical methods.

10. What are the differences between Water and Air

Ans

Water	Air
1. The components of water are hydrogen and oxygen which are chemically combined in a fixed ratio of 1:8 by mass.	1. The main components of air are nitrogen, oxygen, carbon -dioxide, water vapour which are not chemically combined.
2. The chemical composition of water remains same from whatever source it is obtained.	2. The composition of air varies from place to place. During rainy season the air becomes humid due to presence of more water vapour. Some impurities like sulphur dioxide, hydrogen sulphide etc. also changes its composition at some places.
3. The properties of water are completely different from the properties of elements from which it is formed i.e. hydrogen and oxygen.	3. The components of air retain their individual properties but not air.
4. Energy change occurs in the formation of water.	4. No energy change occurs when components of air are mixed together.
5. A molecule of water is represented by a definite formula H_2O .	5. Air cannot be represented by any chemical formula.

11. What are the Differences Between Compound and Mixture?

Sl. No.	Differentiating Property	Compound	Mixture
1	Definition	Compound are substances which can be formed by chemically combining two or more elements.	Mixtures are substances that are formed by physically mixing two or more substances.
2	Types	Compounds can be of three types, which are: covalent compounds, metallic compounds and ionic compounds. Note: Compounds can be classified as organic compounds or inorganic compounds depending on the presence of carbon in the molecular structure.	Mixtures are mainly of two types i.e. homogenous mixtures and heterogeneous mixtures.
3	Substance Category	Compounds fall under pure substances.	Mixtures can be categorized as impure substances.
4	Composition Details	The chemical composition of compounds is always fixed.	A mixture can have a variable composition of the substances forming it.
5	Nature	Compounds are always homogeneous in nature	Mixtures can either be homogeneous or heterogeneous in nature.
6	Separation of Constituents	The constituents of a compound can only be separated by either chemical or electrochemical methods (like extraction).	Mixtures can be separated into their constituents via physical separation methods such as filtration. Thus, the separation of mixtures is relatively easier than the separation of chemical compounds.
7	Properties	The properties of compounds are unique to themselves and need not necessarily reflect the properties of the constituent elements.	The constituents of a mixture do not lose their properties and so, the properties of a mixture are generally the sum of the properties of its constituents.
8	New Substance	A new substance is formed after the constituents are chemically combined. So, a compound has different properties from its constituents.	No new substances are formed in mixtures and their properties are dependent on the properties of their respective constituents.
9	Melting and Boiling Points	The melting and boiling points of a compound are always defined.	The melting and boiling points of a mixture are not defined.
10	Example	Water, salt, baking soda, etc.	Oil and water, sand and water, smog (smoke + fog), etc.

12. What is called Separation?

Ans. The process by which constituents forming a mixture are set apart from one another to get a pure substance is called Separation.

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

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

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

14. 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:

- a. The physical static of the components of the mixture and
- b. 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.

15. What is Winnowing?

Ans. This method is used to separate light solid from heavier ones.

16. What is Hand Picking?

Ans. This method is used when the quantity of a mixture is small and the substance to be separated forms a small portion a small portion of the mixture.

17. What is Sieving?

Ans. Sieving is a separation technique based on the difference in particle size. The sieve is responsible for retaining the larger particles.

18. What is Magnetic Separation?

Ans. This method is used to separate magnetic solid from non-magnetic solid.

Ex: Separate iron dust from the mixture of Iron and sand.

19. What is Sublimation?

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

20. What is Sedimentation?

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

21. 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.

22. What is Decantation?

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

23. What is Loading?

Ans. The process of helping fine solid particles in a solid liquid mixture to settle faster by adding a special chemical is called Loading or Coagulation.

24. What is Filtration?

Ans. This is the process of separating insoluble solid particles from a liquid by allowing it to pass through a filter is called Filtration.

25. What is Filtrate and Residue?

Ans. The solid which collects in the filter paper is called the residue.
The clear liquid which passes through the filter paper is called the filtrate.

26. What is Evaporation?

Ans. It is the process of converting a liquid into its vapour state either by exposing it to air or by heating.

27. What is Crystallisation?

Ans. It is the process of obtaining crystal from a solution containing more solute than it can hold at room temperature.

28. What is Distillation?

Ans. It is the method of getting a pure liquid from a solution by evaporating and then condensing.

29. What is Distillate?

Ans. When a solution is heated the liquid component of the mixture evaporates in the form of vapour. These vapours are then condensed back into the liquid form which is very pure is called Distillate.