

## Is Matter Around Us Pure

### ONE MARK QUESTIONS

- Name the process by which all dyes present in black ink be recovered.  
Ans :  
Chromatography.
- Name the process by which pure copper sulphate can be obtained from its impure sample.  
Ans :  
Crystallization.
- Naphthalene and sand can be separated by the process of-  
Ans :  
Sublimation.
- Milk of Magnesia is a-  
Ans :  
True solution.  

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- A system which have same properties throughout is called-  
Ans :  
Homogeneous.
- A homogeneous mixture of two or more substances called-  
Ans :  
Solution.
- A colloid which have liquid as dispersed phase and solid as dispersion medium called-  
Ans :  
Gel.
- The component of solution that is present in smaller proportion  
Ans :  
Solute.
- An element made up of only one type of—  
Ans :  
Atom.
- Name of process used to separate liquids which have difference in boiling points of less than  $25^{\circ}\text{C}$ —  
Ans :  
Fractional distillation.
- What are two types of matter on the basis of composition?  
Ans :  
Pure substance and mixture.
- Name two categories of pure substance.  
Ans :  
Element and compound.
- Name the types of mixtures.  
Ans :  
Homogeneous mixture and heterogeneous mixture.
- Write the name of any two compounds which sublime on heating.  
Ans :  
Ammonium chloride and iodine.
- Give two examples of colloids from your daily life.  
Ans :  
Milk and fog.
- Define the term Solvent.  
Ans :  
Component of solution that is present in the larger proportion and dissolves the other substance is called Solvent.
- Classify the elements.  
Ans :  
(1) Metals, (2) Non-metals, and (3) Metalloids.
- Name the constituents of German silver.  
Ans :  
Copper and zinc.
- What is the meaning of 'concentration of solution'?  
Ans :  
The relative amount of solute and solvent present in a given quantity of the solution is known as the concentration of a solution.

20. What is condenser?

Ans :

It is an apparatus which converts gas into liquid by cooling it.

21. Define dispersion medium.

Ans :

It is the component which is present in excess and acts as a medium in which colloidal particles are dispersed.

22. Define Chromatography.

Ans :

The process of separation of different dissolved constituents of a mixture by absorbing them over an appropriate absorber is called, Chromatography.

23. Give natural example of mixture.

Ans :

Sea water, minerals, soil.

24. Give an example of a liquid and liquid type solution.

Ans :

Vinegar is a mixture of acetic acid and water.

25. What is the principle of separation?

Ans :

The difference in physical or chemical properties of components of mixture is the basis of separation.

26. What is the meaning of 'Kroma'?

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Ans :

'Kroma' means colour in Greek.

27. Name a metal which is liquid at room temperature.

Ans :

Mercury.

28. Give chemical name of chalk and quicklime.

Ans :

- (i) Chalk : Calcium Carbonate
- (ii) Quicklime : Calcium Oxide

29. Define the term heterogeneous.

Ans :

A substance that does not have the same properties throughout the mixture is called heterogeneous.

30. Name two metals which are highly malleable and ductile.

Ans :

Gold and silver.

31. Hydrogen is considered as element. Why?

Ans :

Hydrogen have one type of element and it cannot be broken by physical or chemical process, so it is considered as element.

32. Identify the following as physical or chemical changes

:

- (a) Formation of cloud
- (b) Magnetizing a iron nail
- (c) Water boils to form steam
- (d) An almirah gets rusted

Ans :

(a)	Formation of cloud	Physical change
(b)	Magnetizing a iron nail	Physical change
(c)	Water boils to form steam	Physical change
(d)	An almirah gets rusted	Chemical change

### THREE MARKS QUESTIONS

33. Give difference between mixture and compound.

Ans :

	Compounds	Mixtures
1.	Compounds are pure substances.	Mixtures are impure substances.
2.	Compounds are made up of two or more elements combined chemically.	Mixtures are made up of two or more substances mixed physically.
3.	The components of a compound are present in a fixed ratio.	The components of a mixture are present in different ratio.
4.	Compounds have same properties throughout the compound part.	Mixtures do not have same properties throughout the mixture part.
5.	A new substance is formed.	No new substance is formed.
6.	The components of a compound can be separated only by chemical methods.	The components of a mixture can be separated by physical methods.

34. Write the properties of a Solution.

Ans :

- (i) It is a homogenous mixture of solute and solvent.
- (ii) Solute particles cannot be separated by filtration.
- (iii) True solution is clear and transparent.
- (iv) True solution does not scatter light.
- (v) Solute particles cannot settle out from solvent.

35. Write the properties of a colloidal solution.

Ans :

- (i) The size of particles is too small of a colloid; vary from 1 nm to 10 nm.
- (ii) Colloid is too stable thus the particles do not

settle down when left undisturbed.

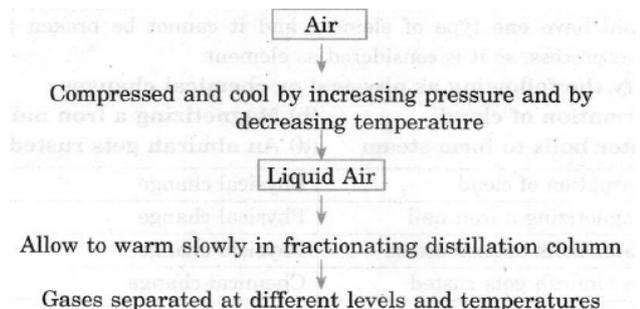
- (iii) Particles cannot be separated from the mixture by the process of filtration.
- (iv) Colloidal solutions are translucent in nature.
- (v) The particles of a colloidal solution scatter light.

36. Draw a flow chart showing the separation of components of Air.

Ans :

Air is a homogeneous mixture and its components can be separated by fractional distillation.

Steps : Flow chart :



Gases	Oxygen	Argon	Nitrogen
Boiling point	—183	—186	—196
% air by volume	20.9	0.9	78.1

37. What makes water as a universal solvent?

Ans :

Water acts as a universal solution due to :

- (i) The polar nature of its molecules.
- (ii) Its ability to produce soluble salt on interaction with a large number of substances.

38. (i) State the principle of the process of centrifugation.  
(ii) List any three applications of centrifugation.

Ans :

- (i) Centrifugation is the process of separating suspended particles from a liquid like colloids by churning the liquid at a high speed. The principle is that denser particles are forced to the bottom and lighter stay at the top when spun rapidly.
- (ii) Applications of centrifugation :
  - (a) Used in dairies and homes to separate cream from milk or butter from cream.
  - (b) Used in washing machines to squeeze out water from clothes.
  - (c) Used in laboratories to separate colloidal particles from their solutions.
  - (d) Used in diagnostic labs for blood and urine test.

39. What is decantation? Explain.

Ans :

Decantation is the process of separating insoluble solids from liquids. A suspension of solid particles in a liquid is allowed to stand for sometime. Insoluble solid particles settle down at the bottom due to their weight. This is called sedimentation. The clear liquid is then transferred into another container, without

disturbing the settled particles. In other words, clear liquid is decanted and separated from solid.

40. How will you separate a mixture of common salt, camphor and iron filings. Describe the process.

Ans :

Mixture of common salt, camphor and iron filings :

- (i) Magnet is passed over the mixture several times. Iron filings get attached to the magnet and are separated.
- (ii) Camphor is separated from the salt by sublimation. Camphor is collected as sublimate and common salt is separated as residue.

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41. Differentiate between physical and chemical changes.

or

Write any three differences between a physical change and a chemical change.

Ans :

Given below is a comparison of two types of changes :

	Physical changes	Chemical changes
(i)	Changes take place only in properties such as colour, physical state, density, etc.	Change results in the formation of new chemical substance(s).
(ii)	Change is temporary.	Change is permanent.
(iii)	Original substance(s) can be obtained back easily.	Original substance(s) cannot be obtained back easily.
(iv)	Chemical properties of a substance remain unchanged even after the change.	New substance(s) with different properties are formed.

42. Melting of wax is a physical change but burning of wax is a chemical change. Explain.

Ans :

- (i) Melting of wax changes the state of wax from solid to liquid. No new substance is formed. The chemical nature of solid wax and liquid wax is the same. Hence, melting of wax is a physical change.
- (ii) Burning of wax gives new gaseous products. Both the physical and chemical changes are taking place. Hence, burning of wax is a chemical change.

43. Why is water considered as compound?

Ans :

Water is considered as compound because :

- (i) Water is composed of two elements : hydrogen and oxygen.
- (ii) The ratio of hydrogen and oxygen by mass in any sample of pure water is the same.
- (iii) The properties of water are different from its constituent elements : hydrogen and oxygen.
- (iv) Water can be decomposed by chemical means only

(e.g. electrolytically) into hydrogen and oxygen.

44. Give some examples where the property : malleability and ductility of metals are used in our life.

Ans :

Malleability means that metals can be hammered into sheets and foils. For example : Aluminium foils are used for wrapping food stuffs, silver foils are used for decorative purposes for sweets and fruits.

Ductility means that metals can be drawn into wires. Example : Gold and silver wires are used in ornaments, aluminium and copper wires are used for conduction of electric current.

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45. Write characteristics of compounds.

Ans :

Characteristics of compounds :

- (i) Compounds are the substances formed by chemical combination of two or more elements.
- (ii) The constituent elements are present in a fixed ratio.
- (iii) A chemical reaction takes place during the formation of a compound.
- (iv) Properties of a compound are different to those of its elements.
- (v) Constituent elements cannot be separated by physical processes.

46. How can you test the purity of a given substance?

Ans :

A pure substance always has the same taste, colour or texture at particular temperature and pressure and fixed melting or boiling point. For example : Pure water boils at 100°C but if it has some impurities then water boils at a temperature above 100°C.

### FIVE MARKS QUESTIONS

47. What is chromatography? What is its advantage over other methods of separation?

Ans :

Chromatography is the process to separate different components of a mixture by absorbing over a suitable absorber. The main advantages of this technique is :

- (i) It can be used for small amount of mixture.
- (ii) Component of mixture do not get wasted.
- (iii) Constituent of mixture can be identified apart from separation.

48. Give difference between true solutions and colloidal solutions.

Ans :

True Solutions	Colloidal Solutions
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(i)	The particle size is very small.	The particles size is bigger than true solution.
(ii)	True solutions are clear and transparent.	Colloidal solutions are translucent.
(iii)	The particles are not visible under microscope.	The particles are visible under microscope.
(iv)	The particle of a true solution can be recovered.	The particles of a colloidal solution cannot be recovered.
(v)	The particles of a true solution do not scatter light.	The particles of a colloidal solution scatter light.

49. Explain sublimation process with labelled diagram.

Ans :

The process of converting solid form directly into vapour form is called sublimation. This is a reversible process.

**Process :**

- (i) Take some camphor or ammonium chloride.
- (ii) Crush the compound and put it in china dish.
- (iii) Fit an inverted funnel over the china dish.
- (iv) Put a cotton ball on the stem of the funnel.
- (v) Heat the china dish slowly and observe.

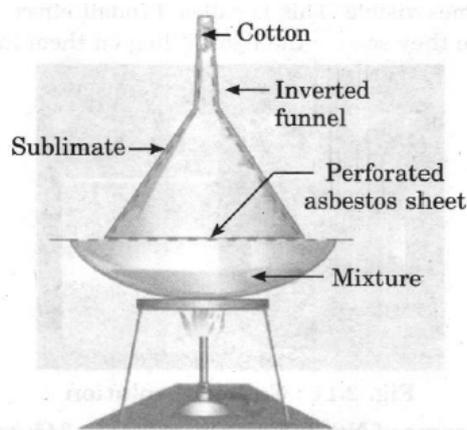
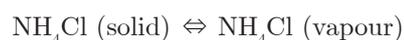


Figure: Separation of ammonium chloride and salt by sublimation

Ammonium chloride is the molecule which on heating changes directly into gaseous state. When vapours of ammonium chloride collected then solid ammonium chloride is formed.



**Observation :** A change of state directly from solid to gas without changing into liquid state (or vice versa) is observed, this phenomenon is called sublimation.

50. Give difference between colloidal solutions and suspensions.

Ans :

Colloidal Solution	Suspension
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The size of particles of solute is smaller than the size of suspension.	The size of particles of solute is more than the size of colloidal solution.
The particles of solute do not settle down when a colloidal solution is undisturbed.	The particles of suspension settle down when a suspension is allowed to settle.
The particles of solute cannot be filtered out.	The particles of suspension can easily be filtered out.

51. What are colloids? Give their characteristics.

Ans :

Colloidal solution is a heterogeneous mixture whose particles are bigger than size of particle in solution but cannot be visible by naked eye. When the beam of light passes through a colloid, then the path of light becomes visible. For example : Milk, smoke, etc.

- (i) **Brownian movement** : The particles of a colloid show Brownian movement. The particles in it never fully settle down even leaving for a long time to remain undisturbed. They show constant zigzag movement. The type of movement is caused by the constant collisions between the particles of the dispersing medium and dispersed phase.
- (ii) **Tyndall effect** : If the beam of light passes through a colloid then the path of light becomes visible. This is called Tyndall effect. The colloidal particles shine because they scatter the light falling on them in all directions.

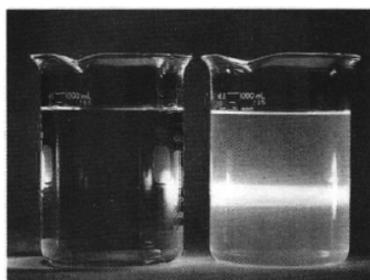


Figure: Colloidal solution

52. Calculate the grams of NaCl (5.25% by mass) in 245 grams of a commercial bleach solution.

Ans :

$$\text{Mass percent} = \frac{\text{Gram of solute}}{\text{Gram of solution}} \times 100$$

$$\begin{aligned} \text{Solute (gram)} &= \frac{\text{Mass percent}}{\text{Gram of solution}} \times 100 \\ &= \frac{5.25 \times 245}{100} = 12.9 \text{ g} \end{aligned}$$

53. 110 g solution of salt is present in 550 g of solution. Calculate the concentration of solution.

Ans :

$$\text{Mass of solute} = 110 \text{ g}$$

$$\text{Mass of solution} = 550 \text{ g}$$

$$\% \text{ composition} = \frac{110 \times 100}{550}$$

$$\text{Concentration} = 20\% \text{ by mass}$$

54. How much water should be mixed with 12 ml of alcohol to obtain 12% of alcohol? Calculate.

Ans :

$$\text{Volume of solute} = 12 \text{ ml}$$

$$\text{Concentration of solution} = 12\%$$

$$\text{Volume of water} = x$$

We know that

Concentration of solution

$$= \frac{\text{Volume of solute}}{\text{Volume of solution}} \times 100$$

$$12 = \frac{12}{12 + x} \times 100$$

$$\frac{12}{100} = \frac{12}{12 + x}$$

$$\frac{100}{12} = \frac{12 + x}{12}$$

$$\frac{100}{12} \times 12 = 12 + x$$

$$100 = 12 + x$$

$$x = 100 - 12$$

$$x = 88 \text{ ml}$$

$$\text{Volume of water} = 88 \text{ ml}$$

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