

Is Matter Around us Pure

1. Which of the following statements is/are correct?
- All the constituent particles of a pure substance are the same in their chemical nature.
 - A pure substance consists of a single type of particles.
 - Most of the matter around us exist as mixtures of two or more pure components.
 - All of these

Ans : (d) All of these

2. If the components of the substance can be separated by a chemical change only then it is a/an
- element
 - compound
 - mixture
 - none of these

Ans : (b) compound

A compound can be separated into its components by chemical means while an element cannot be further separated. A mixture can be separated by physical means.

3. Identify the correct statement(s).
- Mixtures which have a uniform composition throughout are called homogeneous mixtures or solutions.
 - A homogeneous mixture can have a variable composition.
 - Heterogeneous mixtures have non-uniform compositions.
 - All of these

Ans : (d) All of these

4. What type of mixtures are separated by crystallisation?
- A mixture in which one component is soluble in a solvent.
 - A mixture in which impurities are soluble in a solvent.
 - A mixture in which both the components are soluble in a solvent.
 - A mixture in which both the components are insoluble in water.

Ans : (a) A mixture in which one component is soluble in a solvent.

Crystallisation is a process that separates a pure solid in the form of its crystals from a solution.

5. The zigzag movement of dispersed phase particle in a colloidal system is known as
- Brownian motion
 - translational motion
 - circular motion

(d) linear motion

Ans : (a) Brownian motion

The zigzag motion of colloidal particles is called Brownian motion.

6. A student mixed a small amount of iron filings and sulphur powder in a dish. He could not affect the separation by simple hand-picking. Which liquid will you suggest to affect the separation?
- Carbon disulphide
 - Cold water
 - Boiling water
 - Kerosene

Ans : (a) Carbon disulphide

Sulphur is soluble in carbon disulphide while iron filings remain insoluble. Hence, the sulphur will go into solution leaving behind iron filings.

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7. The fine particles of an insoluble substance uniformly dispersed throughout a gas or liquid is called
- suspension
 - precipitate
 - colloidal solution
 - impurity

Ans : (c) colloidal solution

In colloidal solution, dispersed phase is dispersed uniformly in dispersion medium.

8. Substance *P* has the following properties:
- Melts at 80°C
 - Boils at 150°C
 - Insoluble in water

Which method of separation would you use to obtain pure *P* from a mixture of *P* and water?

- Paper chromatography
- Fractional distillation
- Crystallisation
- Filtration

Ans : (d) Filtration

As substance *P* is insoluble in water, it can be separated by filtration.

9. What kind of solution is gel?
 (a) Colloid (b) Mixture
 (c) Emulsion (d) Suspension

Ans : (a) Colloid

Gel is a colloid in which liquid phase is dispersed in solid dispersion medium e.g. jelly, cheese, butter, etc.

10. Pigments of natural colours can be separated by
 (a) chromatography (b) centrifugation
 (c) filtration (d) sublimation

Ans : (a) chromatography

By chromatography technique, components of natural colours can be separated.

11. In 'tincture of iodine', a solute is and a solvent is
 (a) alcohol, iodine (b) iodine, tin
 (c) iodine, alcohol (d) tin, iodine

Ans : (c) iodine, alcohol

A solution of iodine in alcohol is known as 'tincture of iodine'. It has iodine (solid) as the solute and alcohol (liquid) as the solvent.

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12. Which of the following statements are correct about properties of colloids?
 1. A colloid is a homogeneous mixture.
 2. The size of particles of a colloid is too small to be individually seen by naked eye.
 3. Colloids are big enough to scatter a beam of light passing through it and make its path visible.
 (a) 1, 2 and 3 (b) 2 and 3
 (c) 1 and 2 (d) 1 and 3

Ans : (b) 2 and 3

Colloidal solutions are heterogeneous in nature.

13. When a beam of light is passed through a colloidal solution, it gets
 (a) reflected (b) absorbed
 (c) scattered (d) refracted

Ans : (c) scattered

The scattering of beam of light on passing through colloidal solution is known as Tyndall effect.

14. Iodized common salt is
 (a) homogeneous mixture
 (b) heterogeneous mixture
 (c) pure substance
 (d) oxidized substance

Ans : (a) homogeneous mixture

Iodized common salt is a homogeneous mixture since the composition of iodine and salt is fixed throughout the iodized salt and there are no visible boundaries.

15. Pigments of natural colours can be separated by
 (a) chromatography (b) centrifugation
 (c) filtration (d) sublimation

Ans : (a) chromatography

By chromatography technique components of natural colours can be separated.

16. The fine particles of an insoluble substance uniformly dispersed throughout a gas or liquid is called
 (a) suspension (b) precipitate
 (c) colloidal solution (d) impurity

Ans : (c) colloidal solution

In colloidal solution dispersed phase is dispersed uniformly in dispersion medium.

17. Which of the following upon shaking with water will not form a true solution?
 (a) Alum (b) Common salt
 (c) Albumin (d) Sucrose

Ans : (c) Albumin

Albumin will form a colloidal solution since it is not soluble in water.

18. Which of the following will show Tyndall effect?
 (a) Starch solution
 (b) Sodium chloride solution
 (c) Copper sulphate solution
 (d) Sugar solution

Ans : (a) Starch solution

Starch solution will show Tyndall effect i.e. scattering of light since it is a colloidal solution.

19. An emulsion is a colloidal solution formed by mixing
 (a) two miscible liquids
 (b) any two liquids
 (c) any two gases
 (d) two immiscible liquids

Ans : (d) two immiscible liquids

Emulsion is a colloidal solution of two immiscible liquids mixed together e.g., milk.

20. The size of colloidal solution is in the range of
 (a) 1-100 nm (b) 100-1000 nm
 (c) 10^{-5} m – 10^{-7} m (d) 10^7 – 10^9 m

Ans : (a) 1-100 nm

The size of colloidal particles is in the range of 1 to 100 nm.

21. Brass contains
 (a) gold and copper (b) copper and zinc
 (c) zinc and silver (d) copper and silver

Ans : (b) copper and zinc

Brass is an alloy of copper and zinc.

22. Which of the following is a homogeneous mixture?
 (a) Solution of sugar in water
 (b) Chalk powder in water
 (c) Kerosene oil in water
 (d) None of these

Ans : (a) Solution of sugar in water

Sugar solution is a homogeneous mixture.

23. Solutions with low concentrations of solutes are
 (a) concentrated solutions (b) dilute solutions
 (c) solvents (d) none of these

Ans : (b) dilute solutions

Solutions which contain small amount of solute are known as dilute solutions.

24. Which of the following statement is correct?
 (a) A pure substance must contain only one type of atom.
 (b) A mixture containing two compounds must be heterogeneous.
 (c) A heterogeneous mixture must contain atleast three elements.
 (d) A homogeneous mixture must be uniform.

Ans : (d) A homogeneous mixture must be uniform. The mixture which has a uniform composition throughout, is known as homogeneous mixture.

25. If we heat iodine, then it is a
 (a) physical change (b) chemical change
 (c) no change (d) colour change

Ans : (a) physical change
 Iodine is converted into iodine vapours which can be condensed back to get iodine (solid).

26. Which of the following is not an example of a physical change?
 (a) Dissolving sugar in water
 (b) Casting iron in moulds
 (c) Setting of cement
 (d) Magnetisation of iron

Ans : (c) Setting of cement
 Setting of cement is an example of permanent change which is irreversible, thence is not a physical change.

27. Smoke is an example of
 (a) gas dispersed in liquid
 (b) gas dispersed in solid
 (c) solid dispersed in gas
 (b) solid dispersed in solid

Ans : (c) solid dispersed in gas
 In case of smoke solid particles are dispersed in gas.

28. Separation of petroleum into its components is done by
 (a) chromatography (b) sublimation
 (c) distillation (d) fractional distillation

Ans : (d) fractional distillation
 Fractional distillation us used to separate components of petroleum.

29. Which one of the following is correctly matched?
 (a) Emulsion - curd (b) Foam - mist
 (c) Aerosol - smoke (d) Solid sol - cake

Ans : (c) Aerosol - smoke
 Smoke is aerosol, solid dispersed in gas.

30. Iron rod turns red on heating. The change is a
 (a) physical change
 (b) permanent change
 (c) physical and chemical change

- (d) chemical change

Ans : (a) physical change

31. A mixture contains four solid compounds A, B, C, D. On heating C changes to vapour state. C can be separated from rest of the solids by
 (a) crystallisation (b) sublimation
 (c) distillation (d) filtration

Ans : (b) sublimation
 Sublimation technique of purification is used for those solids which are directly converted to gas phase without undergoing liquid phase.

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32. Chemical changes are
 (a) temporary, reversible and a new substance is produced
 (b) always accompanied by exchange of light
 (c) permanent, irreversible and a new substance is produced
 (d) never accompanied by exchange of light and heat energy

Ans : (c) permanent, irreversible and a new substance is produced

33. Identify the false statement.
 (a) Colloids are homogeneous
 (b) Colloids show Tyndall effect
 (c) Colloids show Brownian movement
 (d) The size of colloidal particles ranges between 1-100 nm.

Ans : (a) Colloids are homogeneous
 Colloids are heterogeneous in nature, made up of two different phases viz. dispersed phase and dispersion medium.

34. Select the incorrect statements(s).
 1. Although ice, water and water vapour all look different and display different physical properties, they are chemically the same.
 2. During burning of a candle, both physical and chemical changes take place.
 3. Both water and cooking oil are liquid but their chemical characteristics are different. They differ in odour and inflammability.
 4. It is the physical property of oil that makes it different from water.
 (a) 1 and 2 (b) 2 and 3

- (c) 1, 2 and 3 (d) Only 4

Ans : (d) Only 4

It is the chemical property of oil that makes it different from water.

35. Which gas present in air has the highest boiling point?
 (a) Oxygen (b) Nitrogen
 (c) Argon (d) Hydrogen

Ans : (a) Oxygen

36. Which of the following are metalloids?

1. Boron
 2. Sodium
 3. Silicon
 4. Chlorine
 5. Germanium
- (a) 2 and 4 (b) 1 and 4
 (c) 3 and 5 (d) 1, 3 and 5

Ans : (d) 1, 3 and 5

Sodium is a metal while chlorine is a non-metal.

37. If the component of the substance can be separated by a chemical change only then it is
 (a) element (b) compound
 (c) mixture (d) both (a) and (b)

Ans : (b) compound

A compound can be separated into its components by chemical means while an element cannot be further separated. A mixture can be separated by physical means.

38. Select the odd one out.

- (a) Carbon (b) Oxygen
 (c) Iodine (d) Mercury

Ans : (d) Mercury

Mercury is a metal while carbon, oxygen and iodine are non-metals.

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39. An example of a chemical change is

- (a) formation of clouds
 (b) glowing of an electric light
 (c) dropping sodium into water
 (d) dissolving of salt in water

Ans : (c) dropping sodium into water

Formation of clouds, glowing of an electric light and dissolving of salt in water are the examples of a physical change.

40. Which of the following is not true for a compound?

- (a) A compound is heterogeneous in nature
 (b) A compound contains different elements in a fixed ratio.
 (c) Properties of a compound are entirely different from those of the elements present in it.
 (d) Constituents of a compound cannot be separated by simple physical methods.

Ans : (a) A compound is heterogeneous in nature

41. Which of the following involves both physical and chemical change?

- (a) Burning of a candle (b) Rusting of iron
 (c) Cooking of food (d) Boiling of water

Ans : (a) Burning of a candle

42. What is the name of the insoluble substance which settles to the bottom of its container?

- (a) Solute (b) Solvent
 (c) Sediment (d) Slag

Ans : (c) Sediment

Sediment is the insoluble part of a mixture which settles down at the bottom of its container.

43. We can separate a pure solid from its solution by

- (a) crystallization (b) simple distillation
 (c) sedimentation (d) both (a) and (b)

Ans : (a) crystallization

Only pure solid will be crystallised from its saturated solution.

44. Soda water is a solution of carbon-dioxide in water. What is this solution composed of?

- (a) Liquid solute in a gaseous solvent
 (b) Gaseous solute in a liquid solvent
 (c) Liquid solute in a liquid solvent
 (d) Gas in suspended form in liquid

Ans : (b) Gaseous solute in a liquid solvent

Carbon-dioxide acts a solute in soda water.

1. FILL IN THE BLANK

1. The smell of perfume gradually spreads across a room due to

Ans : diffusion

2. As the volume of a specific amount of gas decreases, it's pressure

Ans : increases

3. Rapid evaporation depends on the area exposed to atmosphere.

Ans : surface

4. As the temperature of a system increases, the pressure of the gases

Ans : increases

5. Matter is made up of small

Ans : particles

6. Liquids that move quickly downhill are described as having

Ans : low viscosity

7. The forces of attraction between the particles are in solids, in liquids and in gases.

Ans : maximum, intermediate, minimum

8. Forces of attraction in liquids are than in solids.
Ans : weaker
9. is the change of gaseous state directly to solid state without going through liquid state, and vice-versa.
Ans : Sublimation
10. The pressure inside a sealed tube, if you raise the temperature go
Ans : up
11. Evaporation causes
Ans : cooling
12. Usually the total charge of a plasma is
Ans : zero
13. Latent heat of fusion is the amount of heat energy required to change 1 kg of solid into liquid at its
Ans : melting point
14. Gas molecules at higher temperatures have more than at cooler temperatures have more than at cooler temperatures.
Ans : kinetic energy
15. Solid, liquid and gas are called the three of matter.
Ans : states
16. As the temperature of a gas decreases, its volume
Ans : decreases

2. TRUE/FALSE

1. Boiling is a bulk phenomenon.
Ans : True
2. Plasmas are all made of the same ions. They have different colours due to different amounts of electricity.
Ans : False
3. Evaporation is a surface phenomenon.
Ans : True
4. A system that changes from a solid state to a liquid state gains energy.
Ans : True
5. The rate of evaporation depends only on the surface area exposed to the atmosphere.
Ans : False
6. You may find plasma in a star.
Ans : True

7. Latent heat of vaporisation is the heat energy required to change 1 kg of a liquid to gas at atmospheric pressure at its melting point.
Ans : False
8. If we pour liquid nitrogen (N₂) into a glass, it will change its state to a solid.
Ans : False
9. Water at room temperature is a liquid.
Ans : True
10. Evaporation and boiling are the same processes because molecules move from a liquid to gaseous state.
Ans : False
11. Atoms in a liquid are farther apart than the atoms in a gas.
Ans : False
12. It is just as easy to compress a liquid, as it is to compress a gas.
Ans : False
13. The molecules in a gas are in constant motion.
Ans : True
14. Because electrons have been stripped away from atoms in plasma, plasmas have a negative charge.
Ans : False

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15. Gases present in air have the same pressure throughout the entire atmosphere.
Ans : False
16. All materials move from solid to liquid to gas as the temperature increases.
Ans : True

3. MATCHING QUESTIONS

DIRECTION : In the section, each question has two matching lists. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

1.

List-I		List-II	
(P)	Fog	(1)	Solid in gas
(Q)	Smoke	(2)	Solid in solid
(R)	Steel	(3)	Solid in liquid
(S)	Toothpaste	(4)	Liquid in gas

	P	Q	R	S
(a)	1	2	4	3

	P	Q	R	S
(b)	4	1	2	3
(c)	1	3	2	4
(d)	1	4	3	2

Ans : (b) P – 4, Q – 1, R – 2, S – 3

2.

List-I		List-II	
(P)	Salt solution	(1)	Suspension
(Q)	Blood	(2)	Colloid
(R)	Smoke	(3)	True solution
(S)	Chalk water	(4)	Emulsion

	P	Q	R	S
(a)	3	4	2	1
(b)	2	4	3	1
(c)	4	2	1	3
(d)	2	4	1	3

Ans : (a) P – 3, Q – 4, R – 3, S – 1

3.

List-I		List-II	
(P)	Miscible liquids	(1)	Distillation
(Q)	Immiscible liquids	(2)	Crystallisation
(R)	Impure copper sulphate	(3)	Sublimation
(S)	Salt and ammonium chloride	(4)	Funnel

	P	Q	R	S
(a)	1	3	2	4
(b)	1	4	2	3
(c)	3	4	1	2
(d)	2	4	3	1

Ans : (b) P – 1, Q – 4, R – 2, S – 3

4.

List-I		List-II	
(P)	Aluminium	(1)	Compound
(Q)	Fluorine	(2)	Metal
(R)	Tellurium	(3)	Non-metal
(S)	Lime stone	(4)	Metalloid

	P	Q	R	S
(a)	1	2	3	4
(b)	4	3	2	1

	P	Q	R	S
(c)	2	3	4	1
(d)	4	2	3	1

Ans : (c) P – 2, Q – 3, R – 4, S – 1

5.

List-I		List-II	
(P)	Rusting of iron	(1)	Physical as well as chemical change
(Q)	Melting of wax	(2)	Chemical change
(R)	Burning of candle	(3)	Physical change
(S)	Baking of cake	(4)	No change

	P	Q	R	S
(a)	1	2	3	4
(b)	2	3	2	1
(c)	2	3	1	2
(d)	4	2	3	1

Ans : (c) P – 2, Q – 3, R – 1, S – 2

4. ASSERTION AND REASON

DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

1. **Assertion :** When a beam of light is passed through a colloidal solution placed in a dark place the path of the beam becomes visible.

Reason : Light gets scattered by the colloidal particles.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Light is scattered by colloidal particles, making the path of the beam visible.

2. **Assertion :** A mixture of benzoic acid and naphthalene can be separated by crystallization from water.

Reason : Benzoic acid is soluble in hot water but naphthalene is insoluble in hot water.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Benzoic acid is soluble in hot water but naphthalene is not soluble, hence separation can be carried out by

hot water crystallisation.

3. **Assertion :** A solution of table salt in a glass of water is homogeneous.

Reason : A solution having different composition throughout is homogeneous.

Ans : (c) Assertion (A) is true but reason (R) is false. A solution having same composition throughout is homogeneous.

4. **Assertion :** A mixture of sugar and benzoic acid can be separated by shaking with ether.

Reason : Sugar is insoluble in water.

Ans : (c) Assertion (A) is true but reason (R) is false. Sugar is soluble in water and insoluble in ether.

5. **Assertion :** In sublimation, a substance changes directly from solid to vapour without passing through liquid state and vice-versa.

Reason : Distillation involves two processes i.e., vaporisation and condensation.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Both are definitions of sublimation and distillation respectively.

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6. **Assertion :** True solution exhibits Tyndall effect.

Reason : Particles are very large in size.

Ans : (d) Assertion (A) is false but reason (R) is true. True solutions do not exhibit Tyndall effect since the particle size is very small to scatter light.

7. **Assertion :** Colloidal solutions are stable and the colloidal particles do not settle down.

Reason : Brownian movement counters the force of gravity acting on colloidal particles.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Due to constant movement of particles colloidal particles do not settle down.

8. **Assertion :** A solution of table salt in a glass of water is homogeneous.

Reason : A solution having different composition throughout is homogeneous.

Ans : (c) Assertion (A) is true but reason (R) is false. A solution having same composition throughout is homogeneous.

9. **Assertion :** Impure benzoic acid can be purified by sublimation.

Reason : Benzoic acid sublimes on heating.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Benzoic acid sublimes on heating while impurities do not.

10. **Assertion :** Tyndall effect is an optical property.

Reason : Electrophoresis is an electrical property.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Scattering of light by colloidal particles is an optical activity. Coagulation of colloidal particles under an electrical field is an electrical property.

11. **Assertion :** A mixture of acetone and methanol can be separated by fractional distillation.

Reason : The difference between their boiling points is very less.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Whenever the difference in boiling points of two liquids is less than 25°C they are separated by fractional distillation.

12. **Assertion :** Chloroform and benzene form a pair of miscible liquids and they are separated by fractional distillation.

Reason : Boiling point of benzene is less than that of chloroform.

Ans : (c) Assertion (A) is true but reason (R) is false. Chloroform (b.pt. 60°C) and benzene (b.pt. 80°) can be separated by fractional distillation since fractional distillation is used for the separation of two or more liquids with difference in their boiling points of less than 25°C .

13. **Assertion :** A mixture of camphor and ammonium chloride cannot be separated by sublimation.

Reason : Camphor on heating sublimes, ammonium chloride does not.

Ans : (c) Assertion (A) is true but reason (R) is false. Both camphor and ammonium chloride sublime on heating.

14. **Assertion :** A mixture of glucose and *m*-dinitrobenzene can be separated by shaking it with ether.

Reason : Glucose is soluble in water.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

15. **Assertion :** Hot water is used for separation of benzoic acid from naphthalene.

Reason : Whenever a crystal is formed it tends to leave out the impurities.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Benzoic acid dissolves in hot water but naphthalene does not therefore, hot water is used for separation of benzoic acid from naphthalene.

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