

QB365

Important Questions -Is Matter Around Us Pure

9th Standard CBSE

Science

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) select a heterogeneous mixture of the following: 1
(a) Air (b) NaCl in water (c) Emulsion (d) Alloy
- 2) Select a compound out of the following: 1
(a) Air (b) Solution (c) marble (d) Stainless steel
- 3) Take 5gm each of iron filings and sulphur in a china dish, state which activity gives a compound. 1
(a) Mix and crush the mixture (b) Add carbon disulphide, stir well and filter
(c) Heat strongly till red hot while mixing (d) Separate iron filings with the help of a magnet
- 4) Cloud is an example of 1
(a) solid dispersed in a gas (b) liquid dispersed in a gas (c) liquid dispersed in a solid
(d) solid dispersed in a gas
- 5) take the statement which is not correct: 1
(a) When a beam of light is passed through a colloidal solution, the path of light gets illuminated.
(b) when an electric current is passed through a colloidal solution, colloidal particles move towards the oppositely charged electrodes.
(c) When an electric current is passed through a colloidal solution, colloidal particles move towards the oppositely charged electrodes.
(d) When an electric current is passed through an electrolyte solution, particles move towards the oppositely charged electrodes.
- 6) A solution is amixture of two or more substances. 1
- 7) The technique of is used to separate a mixture of coloured solutes which are soluble in the same solvent. 1
- 8) Common salt is obtained from sea water by 1
- 9) A substance in which all atoms are alike is called an 1
- 10) What is chemically a pure substance? 1

Section-B

- 11) How does the meaning of pure substance differ for a common man that to a chemist? Explain. 2
- 12) Which of the following materials could be a pure substance? 2
Butter, ghee, water, ink, glass, paper, sugar, banana, orange, marble, blood, wood,
- 13) How would you test the purity of a substance? 2
- 14) Define and explain the term: mixture. 2

- 15) List the various types of homogeneous and heterogeneous mixtures with examples. 2
- 16) Identify the heterogeneous mixture from the following: 2
Air, Soda water, soap solution, brass.
- 17) you are given two liquids A and B. One is a compound or a pure substance and the other is a mixture (solution). How will you select the compound? 2
- 18) When iron filings and sulphur are mixed in a particular fashion, the following observations are made: 2
(i) No iron gats attracted to a magnet placed in the resultant matter.
(ii) A foul smelling gas is released when the mixture is treated with dilute sulphuric acid.
Giving reasons, state whether the resultant substance is a mixture or a compound.
- 19) How do you establish that air is a mixture and not a pure substance? 2
- 20) How do you express concentration of a solution? 2

Section-C

- 21) Explain dispersed phase and dispersion medium in relation to colloidal solution. 5
- 22) Giving example, state the use of a solution, a colloid and a suspension in our daily life 5
- 23) You are given a mixture of sand, water and mustard oil. How will you separate the component of the mixture? 5
- 24) Name the process for separation in the following cases: 5
(i) fine insoluble particles suspended in a liquid.
(ii) A solid substance dissolved in a liquid.
(iii) A sublimable solid mixed with other solids.
(iv) salt from sea water
(v) Three solid substance in a mixture of solvents.
(vi) Two liquids which are completely immiscible.
(vii) two miscible liquid ha^ving 100 C differences in their boiling points.
(viii) Mixture of nitrogen and helium gases.

Section-A

- 1) (c) Emulsion 1
- 2) (c) marble 1
- 3) (c) Heat strongly till red hot while mixing 1
- 4) (b) liquid dispersed in a gas 1
- 5) (c) 1
When an electric current is passed through a colloidal solution, colloidal particles move towards the oppositely charged electrodes.
- 6) homogeneous 1
- 7) chromatography 1
- 8) evaporation 1
- 9) element 1

10)

1

A chemically pure substance is a kind of matter that cannot be separated into other kinds of matter by any physical process. It has the same colour, taste, texture and composition at a given temperature and pressure. It means that constituent particles of a pure substance are the same in their chemical nature or to say that a pure substance consists of a single type of particles.

Section-B

11)

2

For a common man, pure substance that it is not adulterated. for example, for a common man, pure milk means the liquid material that is given by cow or buffalo and it is not mixed with water or other materials to thicken it. But for a chemist, any milk is not a pure substance. Milk is a mixture of water, fats and proteins. These materials are different in milk obtained from different source. Similarly, pure fruit juice for a common man means that it is not mixed with fruit juice of other fruits water or salt. But for a chemist, any fruit juice is a mixture of water and several other substances. For a common man pure gold means gold of a given composition. But a chemist known that no ornaments can be made from pure gold. All ornaments of gold contain gold and copper.

12) Water, sugar.

2

13)

2

A pure substance always has the same colour, taste or texture at a given temperature and pressure. Also it has fixed point or boiling point at constant pressure. Also it has a fixed melting point or boiling point at constant pressure. For example, pure water boils at 373k at 1 atmospheric pressure. But water containing some invisible dissolved substance boils at a temperature above 373k.

14)

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When two or more substance are mixed at random, it forms a mixture. In a mixture the constituent are not chemically combined at random and, it forms a mixture. In a mixture the constituent ate not chemically combined and can be separated into pure substances even by physical processes. Sea water is a mixture of dissolved salt and water substances even by physical processes. Sea water is a mixture of dissolved salts and water. On heating water evaporates and solid salt is left behind. The composition of a mixture can be varied and the properties of a mixture depend on its composition. For example, various types of stainless steel with distinct properties can be prepared by mixing steel with different amounts of chromium and nickel.

15) **homogeneous mixtures**

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(a) Solid solution. Alloys, e.g., brass, steel, bronze.

(b) liquid solution. Sugar solution in water, sea water, alcohol in water.

(c) Gaseous solution. Air, natural gas.

heterogeneous mixtures

(a) Solid + Solid Sugar and sand, iron filings and sulphur, copper sulphate and potassium permanganate

(b) Solid + Liquid Pastes, suspensions, etc.

(c) Solid + gas Smok

(d) Liquid + Liquid Milk, emulsions.

(e) liquid + Gas Soap bubbles

16) Soap solution

2

17)

2

The liquid would boil off at a constant temperature whereas the liquid mixture (solution) would boil off at two different temperatures. Thus the liquid which boils through at a constant temperature is a compound or pure substance.

18)

2

The resultant substance is not a mixture as the properties of the constituents of the mixture are not shown. That is, no iron filings get attracted to a magnet. Dilute sulphuric acid with iron sulphide (a compound) gives a foul smelling gas. Thus, the resultant substance is a compound (iron sulphide) of iron and sulphur.

19)

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Air is a homogeneous mixture of several gases. It can be established as follows:

- (i) The amounts of gases present in air at different places varies only marginally.
- (ii) No definite formula can be assigned to air.
- (iii) The different gases present in air are separable by a physical process: fractional distillation of liquid air.
- (iv) The properties of air are the properties of its constituents. Air supports combustion because of oxygen present in it. Air turns lime water milky due to the presence of carbon dioxide in it.

20)

2

Concentration of a solution may be expressed in terms of percentage by mass of solute per 100 gram of the solution. % Conc. of solution = $\frac{\text{mass of solute}}{\text{Mass of solution}} \times 100$ Thus, if a solution is 5%, it means it is 5 gram of a solute dissolved in 100 gram of the solution or it contains 5 gram solute and 95 gram solvent.

Concentration of a solution may also be expressed as mass of solute dissolved in 100 cm³ of the solution. thus, 10% sugar solution by volume means 10 g sugar dissolved in 100 cm³ of solution.

Section-C

21)

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A colloidal solution is said to be intermediate state of the solution and the suspension. it neither a true solution is said to be intermediate state of the solution and the size is between 1 nm to 100 nm. For example, a solution, the particle size is between 1 nm to 100 nm. For example, a solution of soap in water, milk, blood, writing inks are some of the colloidal solutions. Through these particles are 10 to 1000 times the size of a single small molecule, these are not visible to naked eyes. But these are larger enough to scatter the light that passes through the dispersion medium. The medium of colloidal solution is known as dispersed phase (dispersion medium) and the particles dissolved are called dispersed phase. In milk, water is dispersion phase and fats, proteins etc. are dispersed phase. In fog, water droplets from the dispersed phase and air is dispersing medium.

22)

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Solutions. When two reacting substances are kept in contact, the reaction does not take place or is very slow. But when their solutions are mixed, the reaction takes place very fast. This happens because in solutions, reacting substances come in contact with each other at molecular level. When solid washing soda is poured over cloths, it does not wash but when clothes are mixed with solution of washing soda, clothes are easily cleaned.

Colloids Some insoluble substances particularly in pharmaceuticals become effective when administered in colloidal form. Many medicines are insoluble in water but are used in the form of colloids.

Suspensions. Many substances insoluble or sparingly soluble in dispersing medium become useful for analytical purpose when dispersed temporarily. For example, sparingly soluble barium sulphate dispersed in water is an opaque medium and is used for diagnostic X-rays.

23)

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take the mixture of sand, water and mustard oil a beaker. Allow the solution to stand undisturbed for about half an hour. The heavy sand particles settle down at the bottom of the container. Now transfer the liquid to another beaker in such a way that the sand remains in the first beaker.

take the remaining mixture of mustard oil and water in a separating funnel. Let the funnel to stand undisturbed for half an hour. Water forms lower layer. Open the top of the separating funnel and let the lower layer to collect down in the beaker in another beaker. Thus the components of mixture are separated.

24) (i) centrifugation or decantation.

(ii) evaporation or distillation or crystallisation.

(iii) Sublimation.

(iv) Chromatography.

(vi) Separating funnel.

(vii) Fractional distillation.

(viii) Cooling and fraction.

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