CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

IS MATTER AROUND US PURE

Example Solution

1. How will you justify that water is a compound ?

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2. When two substances X and Y were made to combine, another substance Z was formed. Following observations were recorded :

(a) Large amount of heat was evolved when X and Y were made to

combine.

Predict the nature of the substance Z.

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3. A group of materials 'P' can be sub-divided into three groups 'Q', 'R' and 'S' as the basis of their characteristics The substance belonging to group 'Q' may be solid, liquids and gases. These are poor conduction of electricity. The substances included in group 'R' are solids which are good conductors of electricity. Group 'S' consists of substances which have the characteristics common to the substances belonging to groups 'Q' and 'R'.

Based upon the above observations, answer the following questions :

(a) To which class of substances materials present in group 'P' belong ?

(b) Name the type of substances 'Q'. Give two examples.

(c) Name the type of substances 'R'. Give two examples.

(d) Name the type of substances 'S'. Give two examples.

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4. Classify the following as pure substances or mixtures. Separate the pure substances into elements, compounds and divide the mixtures into homogenous and heterogenous :

(i) Air (ii) Milk (iii) Graphite (iv) Gasoline (v) Diamond (vi) Tap water (vii) Distilled water (viii) Oxygen (ix) Brass (x) 22 Carat gold (xi) Steel (xii) Iron (xiii) Sodium chloride (xiv) Iodised table salt.

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5. state three reasons why you think air is a mixture and water is a compound.

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6. A solution has been prepared by dissolving 5 g of urea in 95 g of water. What is the mass percent of urea in the solution ?

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7. Calculate the masses of cane sugar and water required to prepare 250 g of 25 % solution of cane sugar.

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8. A solution contains 35 g of common salt in 300 g of water. Calculate the concentration of the solution

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9. A solution contains 5 mL of alcohol mixed with 75 mL of water. Calculate the concentration of the solution in terms of volume percent.

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10. Calculate the strength of a solution containing 5 g of glucose in 200 mL of the solution.

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11. What mass of sodium hydroxide must be dissovled in 500 mL of solution so that the strength of the solution may be 10 g/L ?

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12. 4 g of a solute are dissolved in 40 g of water to form a saturated solution at $25^{\circ} C$. Calculate the solubility of the solute.

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13. During an experiment, two students were asked to prepare a 10% (Mass/mass) solution of salt in water. Rahul dissolved 10 g of salt in 100 g of water while Priya prepared it by dissolving 10 g of salt in water to make 100 g of solution.

(a) Do the two solutions have same concentration ? (b) Calculate

mass/mass percentage in each case. (c) Whose measurements are correct for the experiment ?

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14. (a) What mass of potassium chloride would be needed to form a saturated solution in 50 g of water at 298 K ? Given that solubility the salt is 46/100 g at this temperature.

(b) What will happen if this solution is cooled ?

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15. How will you separate iron fillings , ammonium chloride and sand from their mixture ?

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16. How will you separate the constituents present in the following mixtures ?

(i) Common salt and water (ii) Iodine and sand

(iii) Kerosene and water (iv) Sugar and sulphur.

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17. You are given an impure sample of sodium chloride containing impurity of some chalk. How will you purify it ?

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18. Classify the following as physical and chemical changes.

(i) Conversion of milk into curd

(ii) Burning of magnesium ribbon in air

(iii) Rusting of iron nails

(iv) Dissolving salt in water

(v) Burning of cool

(vi) Electrolysis of sodium chloride solution by passing current

(vii) Crystallisation of copper sulphate.

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19. Can physical and chemical changes occur together ? Illustrate your answer.

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NCERT

1. what are pure substance ? Give two example of pure substances.

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2. List the points of differences between homogeneous and heterogenous mixtures.

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3. How are sol, solution and suspension different from each other ?

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4. To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find its concentration at this temperature.

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5. How will you separate a mixture containing kerosene and petrol (difference in their boilling point is more than $25^{\circ}C$), which are miscible with each other ?

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6. Name the technique to separate

(i) butter from curd (ii) salt from sea water (iii) camphor from salt.

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7. What types of mixtures can be separated by technique known as crystallisation ?

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8. Classify the following as chemical or physical changes :

* cutting of trees.
* melting of butter in a pan,
* rusting of almirah,
* boiling of water to form steam,
* passing of electric current, through water and the water breaking down into hydrogen and oxygen gases.
* dissolving common salt in water,

* making a fruit salad with raw fruits, and

* burning of paper and wood.

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9. Try to segregate the things around you as pure substances and mixtures :

(a) distilled water (b) curd (c) diamond (d) ice cream (e) kerosene (f) cooking oil (g) steel (h) graphite (i) raw rubber (j) vulcanised rubber (k) solder wire.

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10. Which separation techniques will you apply for the separation of the following ?

(a) Sodium chloride from its solution in water.

(b) Ammonium chloride from a mixture containing sodium chloride and ammonium chloride.

(c) Small pieces of metal in the engine oil of a car.

(d) Different pigments from an extract of flower petals.

(e) Butter from curd.

(f) Oil from tea.

(g) Tea leaves from tea.

(h) Iron pins from sand.

(i) Wheat grains from husk.

(j) Fine mud particles suspended in water.

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11. Write the steps you would use for making tea. Use the words solution, solvent, solute, dissolve, soluble, insoluble, filtrate and residue.

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12. Pragya tested the solubility of three different substances at different temperatures and collected the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

(a) What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 grams of water at 313 K ?

(b) Pragya makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to cool at room temperature. What would she observe as the solution cools ? Explian.

(c) Find the solubility of each salt at 293 K . Which salt has the highest solubility at this temperature ?

(d) What is the effect of change of temperature on the solubility of a salt ?

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13. Explain the following given examples:

(a) saturated solution (b) pure substance

(c) colloid (d) suspension

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14. Classify each of the following as a homogeneous or heterogeneous mixture: soda water, wood air, soil, vinegar, filtered tea

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15. How would you confirm that a colourless liquid given to you is pure water ?

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16. Which of the following materials fall in the category of a pure substance ?

(a) Ice

(b) Milk

(c) Iron

(d) Hydrochloric acid

(e) Calcium oxide

(f) Mercury

(g) Brick

(h) Wood

(i) Air.

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17. Identify the solutions among the following mixtures.

(a) Soil

(b) Sea water

(c) Air

(d) Coal

(e) Soda water.

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18. Which of the following will show "Tyndall effect "?

(a) Salt solution

(b) Milk

(c) Copper sulphate solution

(d) Starch solution.

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19. Classify the following into elements, compounds and mixtures.

(a) Sodium

(b) Soil

(c) Sugar solution

(d) Silver

(e) Calcium carbonate

(f) Tin

(g) Silicon

(h) Coal

(i) Air

(j) Soap

(k) Methane

(l) Carbon dioxide

(m) Blood

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20. Which of the following are chemical changes ?

(a) Growth of a plant

(b) Rusting of iron

(c) Mixing of iron filings and sand

(d) Cooking of food

(e) Digestion of food

(f) Freezing of water

(g) Burning of a candle

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Very Short Answer Questions

1. A shining thick liquid is often used in glass thermometers. Name it.

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2. Name two metals which are both malleable and ductile.

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3. A diamond knife is quite often used for cutting glass. Why ?

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4. How will check the purity of a pure chemical compound in the solid state ?

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5. A hard substance when bent produces a tinkling sound. Predict its nature.

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6. Give one test to show that brass is a mixture and not a compound.

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7. To the already prepared solution of a solute 'A' prepared in water, a small amount of 'A' is added. However, it does not dissolve. What does it indicate ?

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8. What is the range of the size of the particles of dispersed phase in a colloidal solution ?

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9. When a beam of light was passed through the solution of a substance 'A' dissolved in water, the path of light could be seen. Predict the nature

of the solution.

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10. What will happen if a colloidal solution of sulphur is centrifuged in a centrifugal machine for sometime.

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11. How will you justify that rusting of iron is a chemical change ?

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12. Why do not the dispersed phase particles in a colloidal solution combine with one other ?

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13. What are the units of mass percent ?

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14. What is the nature the solution formed by mixing mustard oil and water ?

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15. Give one example of the colloidal solution in which solid acts as the dispersed phase and gas as the dispersion medium.

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16. Name two compounds which sublime on heating.

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17. You are provided with a mixture of carbon tetrachloride and water. How will you separate the constituents ?

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18. Give one example of (a) solution of a gas in a liquid (b) solution of number of gases.

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19. What is dispersed phase and dispersion medium in a colloid ?

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20. What happens when a saturated solution of sodium chloride prepared at $60^\circ C$ is allowed to cool at room temperature ?

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21. Can we separate alcohol dissolved in water by using a separating funnel? If yes, then describe the procedure.If not, explain.

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22. Sodium chloride contains two elements, but it is still a pure substance. Assign reason.

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23. Classify the following as homogeneous and heterogeneous mixtures :

(a) Copper sulphate solution (b) A suspension of chalk in water (c) Dust storm (d) A dilute solution of alcohol in water.

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24. Why does a salt disappear when dissolved in water ?

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25. Why particles in a true solution cannot be seen with a naked eye ?

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26. Differentiate between simple distillation and fractional distillation.

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27. state one instance where water undergoes a physical change and one in which it which it undergoes a chemical change .

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28. Identify colloids from the following :

Copper sulphate solution, milk, smoke, muddy water, butter, sugar

solution, face cream, lemonade.

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29. When a solution is said to be saturated ? How can you change a saturated solution to an unsaturated solution without adding any more solvent to it ? Explain in brief.

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30. Identify the colloids from the following :

Soda water, milk, sponge, clouds, mixture of alcohol and water, jelly.

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31. List any two properties of metals which make them suitable to be used as :

(i) Utensils for cooking food.

(ii) Wires for electrical connections.

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32. To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find its concentration at this temperature.

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33. Classify the following as compound and mixture. Saline water, water, air, carbon dioxide, hydrogen chloride, milk.

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34. Is sugar a pure or impure substance ?

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35. What the size of solute particle in a true solution ?

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36. Is colloidal solution homogeneous in nature ?

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37. Give one example of suspension and colloidal solution.

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38. Describe a method for separating a mixture of iron filings and sulphur powder other than that by using a magnet.

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39. The zig-zag motion of colloidal particles is called " _____".

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40. Which of the following will show Tyndall effect ?

(a) Sodium chloride solution (b) Starch solution (c) Brass.

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41. What happens when aeledtric field is applied to colloidal solution ?

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42. Explain what happens when a beam of light is passed through a colloidal solution ?

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43. Define solubility of a solution.

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44. what will happen if a saturated solution is : (i) heated , and (ii) cooled ?

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45. Write two characteristics of colloidal solution.

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46. How will you test the purity of a sample of sea water ?

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47. How will you separate small pieces of metals from engine oil ?

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48. Identify the solution among the following :

(a) Air (b) Sea water

(c) Starch solution (d) Milk.

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49. Define mass percent.

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50. 5 g of sodium chloride are dissolved 100 g of water to form a solution.

Is this solution saturated in nature ?

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51. An element is both malleble and ductile.It also produces sonorous sound .In which category would you classify this element ? What are the other characteristics do you expect the element to possess?

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52. Name two solvents other than water.

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53. What type of colloidal solution is milk ?

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54. Can we regard milk as a pure substance ?

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55. What is the nature of sugar solution prepared in water ?

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56. How can a saturated solution by made unsaturated ?

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57. Does air represent a colloidal solution ?

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58. What is the nature of blood ?

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Short Answer Questions

1. What types of mixtures are represented by the following ?

(a) Carbon dioxide gas dissolved in water.

(b) Air containing suspended particles.

(c) Soap bubbles formed by blowing air into soap solution.

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2. Two miscible liquids A and B are present in a solution. The boiling point of A is $60^{\circ} C$ while that of B is $90^{\circ} C$. Suggest a method to separate them.

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3. Solubility of KNO_3at 313 K is 62 g. What mass of KNO_3 would be needed to produce a saturated solution of KNO_3 in 50 g of water at 313 K ?

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4. You are given two liquids, on a solution and the other a compound. How will you distinguish the solution from the compound ?

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5. What would you observe when :

(a) A saturated solution of potassium nitrate prepared at $60^{\circ}C$ is allowed to cool to room temperature ?

(b) A mixture of iron filings and sulphur is heated strongly ?

(c) A colloidal solution of starch is passed through an ordinary filter paper ?

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6. The teacher instructed three students 'A', 'B' and 'C' respectively to prepare a 50% (mass by volume) solution of sodium hydroxide (NaOH). 'A' dissolved 50g of NaoH in 100 mL of water. 'B' dissolved 50g of NaOH in

100g of water while 'C' dissolved 50g of NaOH in water to make 100 mL of solution. Which one of them has made the desired solution and why?

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7. Point out whether the following statements are true or false :

(i) Particles in a colloidal solution can always be seen by naked eyes.

(ii) Scattering of light occurs when a beam of liquid is passed through aqueous sugar solution.

(iii) Colloidal solutions are of heterogeneous nature.

(iv) Digestion of food is a chemical change.

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8. Calculate the mass of potassium sulphate required to prepare its 10 percent (mass percent) solution in 100 g of water.

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9. What volumes of ethyl alcohol and water must be mixed together to prepare 250 mL of 60 percent volume by volume solution of alcohol in water ?

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10. (a) Two students Ramesh and Alka were required to prepare 10 percent (mass/mass) solution chloride in water. For that, Ramesh dissolved 10 g of the salt in 100g of water while Alka dissolved 10g of the salt in water to make 100g of the solution. Which out of the two prepared the correct solution ?

(b) You are given a solution of a substance 'A'. How will you test whether it is saturated or unsaturated with respect to 'A' at a given temperature ?

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11. How much water should be mixed with 12 mL of alcohol so as to obtain 12 % alcohol solution ?

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12. (a) All mixtures are homogeneous. Is this statement correct ? Justify your answer.

(b) How can a saturated solution be made unsaturated ?

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13. (a) Name a non-metallic element found in (i) liquid state (ii) gaseous state.

(b) Pick metalloid from the elements carbon, silicon, phophorus, gold.

(c) Which two properties of metals enable us to give the desired shapes to metals ?

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14. (a) Name a metal which is liquid at room temperature.

(b) Smoke and fod are aerosols. How do they differ from each other ?

(c) Name an element which melts when kept on the palm.

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15. (a) Name a metal which is the best conductor of heat.

(b) Among the substances given below choose the element, mixture and compound.

(a) Air (b) Lead (c) Diamond (d) Calcium carbonate.

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16. (a) Draw a flow sheet diagram to show the process of obtaining constituent gases from air.

(b) Which gas condenses first ? Why ?

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17. Name the appropriate methods for the separation of the following :

(a) nitrogen from air (b) dye from blue ink (c) cream from milk (d) ammonium chloride from common salt.

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18. (a) Identify the solute and solvent in tincture of iodine.

(b) Why is Tyndall effect not seen in a true solution ?

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19. (a) Arrange solids, liquids and gases in increasing order of the following properties of matter

rigidity (ii) diffusion (iii) compressibility.

(b) Write one example from your daily life which is based on diffusion of gases.

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20. List the two conditions essential for using distillation as a method for separation of the components from a mixture.

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21. Water is a compound and not a mixture. Justify the statement giving two reasons.

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22. (a) Write one property of suspension.

(b) Identify solute and solvent in 80% solution of ethyl alcohol with water.

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23. (a) Classify Brass and Diamond as element and mixture.

(b) How is a chemical change different from a physical change ?

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24. (a) Identify the heterogeneous mixture from the following :

Air, soda water, soap solution, brass.

(b) Write two components of a colloidal solution. Give an example.

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25. Distinguish between elements and compounds with one example of each.

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26. A solution contains 60 g of sugar in 480 g of water. Calculate the concentration of solution in terms of mass by mass percentage of the solution.

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27. Identify the dispersed phase and dispersion medium in the following examples of colloids :

(a) Fog (b) Cheese (c) Coloured gem stone.

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28. Define a solution. If 10 mL of H_2SO_4 are dissolved in 90 mL of water, calculate concentration of solution.

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29. (a) 110 g of a solute are present in 550 g of solution. Calculate the concentration of solution.

(b) Give any three points of difference between true solution, colloidal solution and suspension.

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30. State which of the following solutions exhibit Tyndall effect :

Starch solution, Sodium chloride solution, Tincture of iodine, Air.

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31. what is tyndall effect ? List any three differences between colloidal solution and suspension.

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32. 12 mL of dettol is added to a beaker containing 500 mL of water and is stirred. State four observations that you make.

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33. Properties of a compound are different from its constituents, while a mixture shows the properties of its constituents elements. Justify this statement taking the example of iron and sulphur.

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34. Can physical and chemical changes occur together ? Illustrate your answer.

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35. On dissolving chalk powder in water, a suspension is obtained. Give any four reasons to support the fact that mixture so obtained is a suspension only.

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36. Name the type of colloids in each of the following giving an example of each.

	Dispersed Phase	Dispersing Medium
A	Liquid	Gas
B	Liquid	Liquid
C	Liquid	Solids

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37. what is the difference between colloids and suspensions ?

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38. Give an example each for the mixture having the following characteristics. Suggest a suitable method to separate the components of these mixtures.

(a) A volatile and a non-volatile component.

(b) Two volatile components with appreciable difference in boiling points.

(c) Two immiscible liquids.

(d) One of the components changes directly from solid to gaseous state.

(e) Two or more coloured constituents soluble in some solvent.

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39. Give an example for each of following :

(a) Solid-liquid homogeneous mixture

(b) Gas-Gas homogeneous mixture

(c) Liquid-Liquid heterogeneous mixture.

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40. List two differences between a pure substance and a mixture. Give an example of each.

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41. Why is crystallisation better than evaporation for the separation of mixtures ?

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42. Give one example each of a mixture which shows the following characteristics.

(a) A mixture of two volatile component.

(b) A mixture of two volatile components with a boiling point difference less than 25 K.

(c) A mixture of a volatile and a non-volatile component.

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43. Differentiate between an element and a compound. Categorise the following substances into elements and compounds.

Sodium chloride, iodine, water, 24 carat gold, oxygen gas, carbon.

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44. Explain why , air is considered a mixture and not a compound.

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45. Compare suspension and colloidal solution on the basis of (a) type of mixture (b) particle size (c) scattering of light (d) stability.

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46. A solution contains 50 g of sugar in 450 g of water. Calculate the concentration in terms of mass by mass percentages of the solution.

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47. What is 'Tyndall effect' ? Name two mixtures which show this effect.

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48. Give two differences between pure substances and mixture. Give one example of each.

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49. What is the difference between (i) Pure substance and mixture (ii) Colloidal solution and true solution. Give an example of each.

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50. Compare the particle sizes in a true solution, colloidal solution and suspension.

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51. Does freezing of water to ice represent a physical change ?

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52. Discuss the role of centrifugation in removing the precipitate formed in a solution.

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53. How will you justify that the formation of water from hydrogen and oxygen is a chemical change and not a physical change ?

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54. 4 g of a solute are dissolved in 36 g of water. What is the mass percent of the solution ?

A. $10\ \%$

B. $30\ \%$

C. $25\ \%$

D. $50\ \%$

Answer: A

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55. Is the mass percent of a solution same as its strength ? Justify your answer.

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56. What is solubility of a salt ? Discuss the effect of temperature on the solubility of sodium chloride in water.

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57. Mention the following statements whether true or false :

(i) The separation of constituents from homogeneous mixture is easier as compared to heterogeneous mixture.

(ii) True solutions also show Tyndall effect.

(iii) Air represents a solution in terms of science.

(iv) Alcohol and water can be separated by fractional distillation

(v) A chemical change can be easily reversed.

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58. 60% solution of alcohol has a volume of 70 mL. What is the volume of pure alcohol in the solution ?

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Long Answer Questions

1. (a) Colloidal solutions show Tyndall effect but true solutions do not. Discuss.

(b) Explain how does soap help in cleaning dirty clothes ?

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2. Fog and cloud are both colloidal in nature. How do they differ ?

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3. (a) Can we separate a mixture of water and alcohol by the use of a separating funnel ? If not, suggest a suitable method.

(b) You are provided with two liquids, one is a mixture of two miscible liquids while the other is a pure compound. Suggest two ways to distinguish them from each other.

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4. Classify the following as physical and chemical changes. Give reason for your answer.

(a) Burning of candle. (b) Melting of ice.

(c) Burning of petrol in an engine. (d) Change of colour of iron bar on strong heating

(e) Churning of milk to get butter.

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5. Give an example of a mixture which exhibits following characteristics.

(a) Two non-mixcible components. (b) Two volatile components with appreciable difference in boiling points.

(c) Two coloured components. (d) Water containing certain suspended particles.

(e) Water containing a soluble salt. (f) A volatile and a non-volatile component.

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6. You are provided with a mixture containing sand, iron filings, ammonium chloride and sodium chloride. Describe the procedures you would use to separate these constituents from the mixture?

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7. Process of simple distillation can be used to separate the constituents from a liquid mixture differing the their boiling points by $25^{\circ} C$ or more.

However, fractional distillation is effective if the difference in boiling points is less than $25^{\circ} C$. How will you explain this ?

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8. Give an example of a mixture which exhibits following characteristics.

(a) Two non-mixcible components. (b) Two volatile components with appreciable difference in boiling points.

(c) Two coloured components. (d) Water containing certain suspended particles.

(e) Water containing a soluble salt. (f) A volatile and a non-volatile component.

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9. Rama tested the solubility of four substances at different temperatures and found in grams of each substance dissolved in 100 g of water to form a saturated solution.

	Substance dissolved (in grams)	Temperature (K) 293 K	313 K	333 K
1.	Ammonium chloride	37 g	41 g	55 g
2.	Potassium chloride	35 g	40 g	46 g
3.	Sodium chloride	36 g	36 g	37 g
4.	Potassium nitrate	32 g	62 g	106 g

(i) Which substance is least soluble at 293 K.

(ii) Which substance shows maximum change in its solubility when the temperture is raised from 293 K to 313 K ?

(iii) Find the amount of ammonium chloride that will separate out when 55 g of its solution at 333 K is cooled to 293 K.

(iv) What is the effect of temperature on the solubility of a salt ?

(v) What mass of sodium chloride would be needed to make a saturated solution in 10 g of water at 293 K ?

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10. (a) What is fractional distillation ? What is the use of fractionating column in fractional distillation?

(b) Draw a labelled diagram of the fractional distillation apparatus distillation apparatus used for separating a mixture of alcohol and water

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11. (a) To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find the concentration at this temperature.

(b) What is the effect of temperature on the solubility of a solid in a liquid ?

(c) Why is it possible to distinguish the particles of a solute from those of a solvent in a suspension ?

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12. (a) In which category of mixtures will alloys is classified and why ?

(b) Solution is always a solid or liquid or gas.comment.

(c) A solution is homogeneous or heterogeneous?

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13. (a) Why is crystallisation technique better than evaporation ?

(b) Write any two physical properties each of metals and non-metals.

(c) Name the technique used to separate butter from curd.

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14. Define distillation. What type of mixtures can be separated by distillation ? Draw a labelled diagram of the apparatus used for fractional distillation.

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15. You are given a mixture of sand, water and mustard oil. How will you separate the components of this mixture ? Explain with the help of different separation methods involved in it.

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16. Sudha tested the solubility of four salts X, Y, Z and T as different temperature and collected the following data. (Solubility refers to the amount in grams dissolved in 100 g of water to give a saturated solution.)

Salt dissolved	Temperature in Kelvin				
	290 K	313 K	323K	343K	353K
	Solubility				
X	22	34	40	93	109
Y	43	43	46	50	50
Z	27	30	34	37	40
T	25	38	42	54	64

Answer the following question from the table

(i) Which salt has the highest and lowest solubility at 323 K ?

(ii) A student prepared a saturated solution of X at 323 K and then added 25 g water to it. Water mass of X must be added to again make the solution saturated ?

(iii) The solubility of which salt is least affected by increase in temperature ?

(iv) What mass of 'T' would be required to make saturated solution in 200 g of water at 290 K ?

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17. (a) Enumerate any two differences between simple distillation and fractional distillation.

(b) Draw a labelled diagram showing the process of fractional distillation.

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18. Why is crystallisation better than evaporation for the separation of mixtures ?

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19. Which separation techniques you will apply for the separation of the following mixtures ?

(a) Oil from water

(b) Camphor from sand

(c) Sodium chloride from its solution in water

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20. (a) 'Water is considered as a compound of hydrogen and oxygen and not a mixture of hydrogen and oxygen'. Comment on it.

(b) Differentiate between a compound and a mixture (any three points).

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21. How will you separate a mixture containing kerosene and petrol (difference in their boiling point is less than 25 K) which are miscible with each other ? Explain.

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22. Explain the terms dilute solution, concentrated solution and saturated solution. How would you determine the solubility of a solution ? What is the effect of change of temperature on the solubility ?

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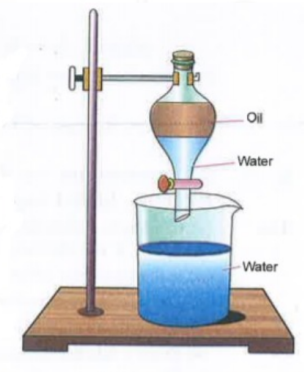
23. Observe the apparatus shown and answer the following questions.

(a) Identify the apparatus



(b) Design an activity to use this apparatus to separate the mixture oil and water.

(c) Write the principle involved in this process.

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24. What is chromatography ? State its two applications.

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25. (a) Compare metals and non-metals based on their physical properties (any two).

(b) What are metalloids ? Give two examples.

(c) Identify metals from the following :

boron, sodium, mercury, carbon.

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26. List four physical properties of metals. Name two metals. Name a metal which is liquid at room temperature.

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27. How will you purify an impure sample of copper sulphate containing some suspended impurities in it ?

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28. Give the main points of distinction in true solution, colloidal solution and suspension.

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29. What is Tyndall effect ? How does it help in noticing the particles present in a colloidal solution ?

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30. A mixture of acetone and methanol can be separated by

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31. What are physical and chemical changes ? How will you distinguish between them ?

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32. A mixture whether homogeneous or heterogeneous cannot be a pure substance. Explain.

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33. Calculate the mass of sulphuric acid required to prepare its 20% (mass/mass percent) solution in 100g of water ?

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34. A mixture of alcohol and water is called a true solution while that of mustard oil and water is known as emulsion. How will you account for it ?

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Hots

1. A house wife churned full cream with a milk churner

(i) What will she observe after churning the milk ?

(ii) What could be the possible reason for the observation ?

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2. Based on separation techniques, complete the following. The first one is done for you.

	Mixture	Type	Separation Technique	Principle
1.	Alcohol + water	Homogeneous	Frictional distillation	Difference boiling poi
2.	Sulphur + carbon disulphide	–	–	–
3.	Sand + water	–	–	–
4.	Pigments of flower	–	–	–

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3. The table given below shows number of grams of five different solids dissolving in 100 g of the solvents : water, alcohol and chloroform (all at

$20^{\circ} C$).

Solvent	Salt	Sugar	Iodine	Chalk	Urea
Water	36.0	204.0	0.6	0.0	100.0
Alcohol	0.0	0.0	20.0	0.0	16.0
Chloroform	0.0	0.0	3.0	0.0	0.0

(a) Which solid dissolves best in water at $20^{\circ} C$? (b) Which solid is maximum soluble in alcohol ?

(c) Which solid is insoluble in all the three solvents ?

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4. (a) What is the name given to the liquids which dissolve in a liquid ?

(b) What is the name given to the liquid which contains in it some suspended particles ?

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5. Butter is an example of one type of colloidal solution. Name it. Give a reason for your choice.

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6. (a) The solubility of sodium chloride in water increases with rise in temperature while that of lithium carbonate decreases. Assign reason.

(b) Water containing 88.8% oxygen and 11.2% hydrogen is often used as a fire extinguisher. Can a mixture containing the two gases in the same ratio by mass be used for extinguishing fire ?

(c) The melting point of a solid when determined experimentally comes out to be $160^{\circ} C$. But its actual melting point as given in standard books is $150^{\circ} C$. Predict the nature of the solid.

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Mcq

1. Which of the following statements are true for pure substances ?

(i) Pure substances contain only one kind of particles

(ii) Pure substances may be compounds or mixtures

(iii) Pure substances have the same composition throughout

(iv) Pure substances can be exemplified by all elements other than nickel.

A. (i) and (ii)

B. (i) and (iii)

C. (iii) and (iv)

D. (ii) and (iii).

Answer: B

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2. Rusting of an article made up of iron is called

A. corrosion and it is a physical as well as chemical change

B. dissolution and it is a physical change

C. corrosion and it is a chemical change

D. dissolution and it is a chemical change.

Answer: C

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3. A mixture of sulphur and carbon disulphide is

A. heterogeneous and shows Tyndall effect

B. homogeneous and shows Tyndall effect

C. heterogeneous and does not show Tyndall effect

D. homogeneous and does not show Tyndall effect.

Answer: A

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4. Tincture of iodine has antiseptic properties. This solution is made by dissolving

A. iodine in benzene

B. iodine in ether

C. iodine in water

D. iodine in alcohol.

Answer: D

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5. Which of the following are homogeneous in nature?

(i) Ice (ii) Wood (iii) Soil (iv) Air

A. (i) and (iii)

B. (ii) and (iv)

C. (i) and (iv)

D. (iii) and (iv).

Answer: C

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6. Which of the following are physical changes?

(i) Melting of iron metal

(ii) Rusting of iron

(iii) Bending of an iron rod

(iv) Drawing a wire of iron metal

A. (i), (ii) and (iii)

B. (i), (ii) and (iv)

C. (i), (iii) and (iv)

D. (ii), (iii) and (iv).

Answer: C

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7. Which of the following are chemical changes ?

(i) Decaying of wood

(ii) Burning of wood

(iii) Growth of wood in a tree

(iv) Hammering of a nail on a piece of wood

A. (i) and (ii)

B. (ii) and (iv)

C. (iii) and (iv)

D. (i), (ii) (iii).

Answer: D

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8. Two substances, A and B were made to react to form a third substance, A_2B according to the following reaction $2A + B \rightarrow A_2B$. Which of the following statements concerning this reaction are incorrect

?

(i) The product A_2B shows the properties of substances A and B.

(ii) The product will always have a fixed composition.

(iii) The product so formed cannot be classified as a compound.

(iv) The product so formed is an element.

A. (i), (ii) and (iii)

B. (ii), (iii) and (iv)

C. (i), (iii) and (iv)

D. (ii) and (iv)

Answer: C

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9. Two chemical species X and Y combine together to form a product P which contains both X and Y,

$X + Y \rightarrow P$,

X and Y cannot be broken down into simpler substances by simple

chemical reaction. Which of the following concerning the species X, Y and P are correct?

(i) P is a compound

(ii) X and Y are compounds

(iii) X and Y are elements

(iv) P has a fixed composition

A. (i), (ii) and (iii)

B. (i), (ii) and (iv)

C. (ii), (iii) and (iv)

D. (i), (iii) and (iv)

Answer: D

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1. Suggest separation technique(s) one would need to employ to separate the following mixtures.

(a) Mercury and water

(b) Potassium chloride and ammonium chloride

(c) Common salt, water and sand

(d) Kerosene oil, water and salt

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2. Which of the tubes in Figure (a) and (b) will be more effective as a condenser in the distillation apparatus?

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3. Salt can be recovered from its solution by evaporation. Suggest some other technique for the same?

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4. The 'sea-water' can be classified as a homogeneous as well as heterogeneous mixture. Comment.

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5. While diluting a solution of salt in water, a student by mistake added acetone (boiling point 56°). What technique can be employed to get back the acetone? Justify your choice.

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6. What would you observe when

(a) a saturated solution of potassium chloride prepared at 60°C is allowed to cool at room temperature?

(b) an aqueous sugar solution is heated to dryness?

(c) a mixture of iron filings and sulphur powder is heated strongly?

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7. Explain why particles of a colloidal solution do not settle down when left undisturbed, while in the case of a suspension they do?

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8. Smoke and fog both are aerosols. In what way are they different?

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9. Classify the following as physical or chemical properties.

(a) The composition of a sample of steel is : 98% iron, 1.5% carbon and 0.5% other elements.

(b) Zinc dissolves in hydrochloric acid with the evolution of hydrogen gas.

(c) Metallic sodium is soft enough to be cut with a knife.

(d) Most metal oxides form alkalis on interacting with water.

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10. The teacher instructed three students 'A', 'B' and 'C' respectively to prepare a $50\,\%$ (mass by volume) solution of sodium hydroxide (NaOH). 'A' dissolved 50g of NaoH in 100 mL of water. 'B' dissolved 50g of NaOH in 100g of water while 'C' dissolved 50g of NaOH in water to make 100 mL of solution. Which one of them has made the desired solution and why?

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11. Name the process associated with the following

(a) Dry ice is kept at room temperature and at one atmospheric pressure.

(b) A drop of ink placed on the surface of water contained in a glass spreads throughout the water.

(c) A potassium permanganate crystal is in a beaker and water is poured into the beaker with stirring.

(d) A acetone bottle is left open and the bottle becomes empty.

(e) Milk is churned to separate cream from it.

(f) Settling of sand when a mixture of sand and water is left undisturbed

for some time.

(g) Fine beam of light entering through a small hole in a dark room. Illuminates the particles in its paths.

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12. A sample of water under supply was found to boil at $102^{\circ} C$ at normal temperature and pressure. It the water pure ? Will this water freeze at $0^{\circ} C$? Comment.

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13. _____ metal is alloyed with gold and silver for making coins and jewels.

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14. An element is sonorous and highly ductile. Under which category would you classify this element? What other characteristis do you expect the element to possess?

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15. Give an example each for the mixture having the following characteristics.

(a) gases

(b) Two volatile components

(c) Two immiscible liquids.

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16. Fill in the blanks.

(a) A colloid is a ..... mixture and its components can be separated by the technique known as ..... .

(b) Ice, water and water vapour look different and display different .....

Properties but they are ..... the same.

(c) A mixture of chloroform and water taken in a separating funnel is mixed and left undisturbed for some time. The upper layer in the separating funnel will be of ..... and the lower layer will be that of ..... .

(d) A mixture of two or more miscible liquids, for which the difference in the boiling points is less than 25 K can be separated by the process called ..... .

(e) When light is passed through water containing a few drops of milk, it shows a bluish tinge. This is due to the ..... of light by milk and the phenomenon is called ..... . This indicates that milk is a ..... solution.

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17. Sucrose (sugar) crystals obtained from sugarcane and beetroot are mixed together. Will it be pure substance or a mixture? Give reasons for the same.

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18. Give some examples of Tyndall effect observed in your surroundings?

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19. Can we separate a mixture of alcohol and water by the use of a separating funnel ? If not, suggest an alternate method.

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20. On heating calcium carbonate gets converted into calcium oxide and carbon dioxide.

(a) Is this a physical or chemical change?

(b) Can you prepare one acidic and one basic solution by using the products formed in the above process? If so, write the chemical equation involved.

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21. Non-metals are usually poor conductors of heat and electricity. They are non-lustrous, non-sonorous, non malleable and are coloured.

(a) Name a lustrous non-metal.

(b) Name a non-metal which exists as a liquid at room temperature.

(c) The allotrpic form of a non-metal is a good conductor of electricity .

(d) Name a non-metal which is known to form the largest number of compounds.

(e) Name a non-metal other than carbon which shows allotropy.

(f) Name a non-metal which is required for combustion.

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22. Classify the substances given in Figure into elements and compounds.

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23. Which of the following are not compounds ?

(a) Bromine gas (b) sodium chloride (c) Magnesium

(d) Iron sulphide (e) Aluminium (f) Silver

(g) Carbon (h) Carbon dioxide (i) Sulphur powder.

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Laqs

1. Fractional distillation is suitable for separation of miscible liquids with a boiling point difference of about 25 K or less. What part of fractional distillation apparatus makes it efficient and possess an advantage over a simple distillation process. Explain using a diagram.

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2. (a) In which category of mixtures will you classify alloys and why ?

(b) A solution is always a gas or liquid or solid. Comment.

(c)A solution be homogeneous or heterogeneous ?

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3. Iron filings and sulphur were mixed together and divided into two parts, 'A' and 'B'. Part 'A' was heated strongly while part 'B' was not heated. Dilute hydrochloric acid was added to both the parts and evolution of gas was seen in both the cases. How will you identify the gases evolved?

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4. A child wanted to separate the mixture of dyes constituting a sample of ink. He marked a line by the ink on the filter paper and placed the filter paper in a glass containing water as shown in figure. The filter paper was removed when the water moved near the top of the filter paper.

(a) What would you expect to see, if the ink contains three different coloured components?

(b) Name the technique used by the child.

(c) Suggest one more application of this technique.

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5. A group of students took an old shoe box and covered it with a black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. They placed a milk sample contained in a beaker/tumbler in the box as shown in the Figure. They were amazed to see that milk taken in the tumbler was illuminated. They tried the same activity by taking a salt solution but found that light simply passed through it ?

(a) Explain why the milk sample was illuminated? Name the phenomenon involved.

(b) Same results were not observed with a salt solution. Explain.

(c) Can you suggest two more solutions which would show the same effect as shown by the milk solution?

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6. Classify each of the following, as a physical or a chemical change. Give reasons.

(a) Drying of a shirt in the sun.

(b) Rising of hot air over a radiator.

(c) Burning of kerosene in a lantern.

(d) Change in the colour of black tea on adding lemon juice to it.

(e) Churning of milk cream to get butter.

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7. During an experiment the students were asked to prepare a 10% (mass/mass) solution of sugar in water. Ramesh dissolved 10 g of sugar in 100 g of water while Sarika prepared it by dissolving 10g of sugar in water to make 100 g of the solution.

(a) Are the two solutions of the same concentration?

(b) Compare the mass $\%$ of the two solutions.

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8. You are provided with a mixture containing sand, iron filings, ammonium chloride and sodium chloride. Describe the procedures you would use to separate these constituents from the mixture?

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9. Arun has prepared 0.01% (by mass) solution of sodium chloride in water. Which of the following correctly represents the composition of the solutions?

A. 1.00 g of NaCl + 100 g of water

B. 0.11 g of NaCl + 100 g water

C. 0.01 g of NaCl + 99.99 g of water

D. 0.10 g of NaCl + 99.90 g of water

Answer:

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10. Calculate the mass of sulphuric acid required to prepare its 20% (mass percent) solution in 100 g of water ?

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