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Class: IX
Subject: Science
Topic: Elements, mixtures and compounds
No. of Questions: 20

1. List the points of differences between homogeneous and heterogeneous mixtures.

   Ans: A homogeneous mixture is a mixture having a uniform composition throughout the mixture. For example : salt in water, sugar in water, copper sulphate in water. A heterogeneous mixture is a mixture having a non-uniform composition of the mixture. For example : sodium chloride and iron fillings, salt and sulphur, oil and water

2. Brass is an example of

   A. an alloy
   B. a compound
   C. a mixture
   D. an element

   Ans .(a)

3. A mixture consisting of two miscible liquids 'A' and 'B' whose boiling points differ by $5^{\circ}C$ can be separated by which process ?

   Ans: Fractional distillation.

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.

   Ans: Mass of solute(Sodium chloride) = 36 g(Given)
   Mass of solvent (water) = 100 g (Given)
   Then, mass of solution = Mass of solute+ Mass of solvent
   = (36+100)g
   = 136g
   Therefore, concentration(mass by mass percentage) of the solution
   = $\frac{Mass\ of\ solute}{Mass\ of\ solvent} \times 100\%$
   = $\frac{36}{136} \times 100\%$

= 26.47%

5. Other than O and C, the main elements of a brick wall includes

    A. Si
    B. Ca
    C. Both A and B
    D. None of the Above

    Ans (c)

6. Given the names of the elements present in the following compounds :

    A. Quicklime
    B. Hydrogen bromide
    C. Baking soda
    D. Potassium sulphate

    Ans: (a) Quicklime is calcium oxide, CaO. The elements Present in it are : Calcium (Ca) and Oxygen (O).

    (b) Hydrogen bromide is HBr. The elements present in it are : hydrogen (H), and bromine (Br)

    (c) Baking soda is sodium hydrogen carbonate, $NaHCO_3$ The elements present in it are : Sodium (Na), Hydrogen (H), Carbon (C) and Oxygen (O).

    (d) Potassium sulphate is K_2SO_4. The elements present in it are: potassium (K), Sulphur (S) and Oxygen (O)

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

    Ans: Every liquid has a characteristic boiling point. Pure water has a boiling point of $100 °C$ (373 K) at 1 atmospheric pressure. If the given colourless liquid boils at even slightly above or below $100 °C$, then the given liquid is not pure water. It must boil at sharp $100°$ C. thus, by observing the boiling point, we can confirm whether a given colourless liquid is pure water or not.

8. A compound results from the chemical combination of

    A. two or more atoms
    B. two or more metals
    C. Both A and B
    D. None of the Above

    Ans. (c)

9. What are the advantages of chromatography as a method of separation of components of a mixture ?

    Ans: Main advantages of chromatography are :
    (i)   Only a small quantity of sample is required.
    (ii)   The constituents retain their individual characteristics during the process.
    (iii) The process can be used for separation of constituents even if they have very similar chemical properties.

10. Which of the following is considered to be a pure substance ?

    A. Granite.
    B. Sodium chloride.
    C. Muddy water
    D. Milk of magnesia

    Ans: (B) Sodium chloride being compound is a pure substance. Granite. Muddy and milk of magnesia all are mixtures.

11. Which of the following will show the "Tyndall effect" ?
    A. Salt solution
    B. Milk
    C. Copper sulphate solution
    D. Starch solution

    Ans : Milk and starch solution will show the "Tyndall effect"

12. Why does ice float on water ? Is ice water homogeneous or heterogeneous matter ? Pure or a mixture ?

Ans : Ice is less dense than water. An ice water mixture is pure but heterogeneous in nature.

13. Other than oxygen and calcium, 92% of the earth's crust is made up of

A. silicon
B. Iron
C. Aluminum
D. all of these

Ans. (d)

14. Hydrogen and oxygen combine in the ratio of 1 : 8 by mass to form water. What mass of oxygen gas would be required to react completely with 3 g of hydrogen gas?

Ans: It is given that the ratio of hydrogen and oxygen by mass to form water is 1:8 then, the mass of oxygen gas required to react completely with 1 g of hydrogen gas is 8 g. therefore, the mass of oxygen gas required to react completely with 3 g of hydrogen gas is 8 x 3 g = 24 g.

15. A solid white substance A is heated strongly in the absence of air. It decomposes to form a new white substance B and a gas C. The gas has exactly the same properties as the product obtained when carbon is burned in an excess of oxygen. Based on these observations. Can we determine whether solids A and B and the gas C are elements or compounds ? Explain your conclusions for each substance.

Ans: C is a compound; it contains carbon and oxygen. A is a compound as it decomposes to give B which contains carbon and oxygen and C. B is not defined by the data given; it is probably a compound because few elements exist as white solids.

16. Sometimes we refer to alloys as substitutional solids. Why?

Ans: Alloys contain two or more metals and have a variable composition so they are homogeneous mixtures. E.g. brass contains copper and zinc. Copper is a crystalline solid i.e. in copper atoms are closely packed to form a crystal lattice. When brass is formed some of these atoms of copper have been replaced by atoms of zinc (i.e., zinc atoms have substituted some copper atoms) and due to this brass is considered as substitutional solid solution.

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17. Which postulate of Dalton's atomic theory can explain the law of definite proportions?

And : The postulate of Dalton's atomic theory which can explain the law of definite proportion is the relative number and kind of atoms in a given compound remains constant.

18. The physical properties are individual and not the result of constituting elements in

   A. metals
   B. non-metals
   C. mixtures
   D. compounds

   Ans. (d)

19. Why is a compound considered as pure substance but mixture is not considered as a pure substance ?

    Ans: A compound is a single substance with a fixed composition and so it fulfils the condition required for a pure substance. The m.p or b.p of a compound is fixed. These conditions are not fulfilled by a mixture to it is not considered as a pure substance.

20. Mixtures can be separated into their components by taking advantage of differences in the chemical properties of the components . Why might this separation method be less convenient than taking advantage of differences in the physical properties of the components?

    Ans: During chemical change substance may undergo decomposition or addition that is they themselves change. Therefore, separation of mixture by taking advantage of different in their chemical properties is less convenient.