# Atomic Energy Central School, Mysuru

## Work Sheet

**Subject :** Chemistry **Class :** IX

**Portion covered :** Exploring Mixtures and their Separation

**Name of the student :**_____

**Roll no :**_____ **Class :**_____ **Date:** _____

## I. Multiple choice questions

1. Which of the following mixtures are correctly classified as homogeneous (Hm) and heterogeneous (Ht)? Choose the correct option.
   (i) Air – Hm, Milk – Ht, Sugar solution – Hm, Smoke – Hm
   (ii) Brass – Ht, Fog – Ht, Vinegar – Ht, Muddy water – Hm
   (iii) Copper sulfate solution – Hm, Salt solution – Hm, Milk – Hm, Bronze – Hm
   (iv) Muddy water – Ht, Milk – Ht, Blood – Ht, Brass – Hm
2. Which among the following mixtures show the Tyndall Effect? A mixture of:
   (a) air and dust particles
   (b) copper sulfate and water
   (c) starch and water
   (d) acetone and water
      (i) a and b
      (ii) b and d
      (iii) a and c
      (iv) c and d
3. Assertion (A): Solutions do not exhibit the Tyndall effect.
   Reason (R): The particles in solutions are larger than 100 nm, so they cannot scatter light. Choose the correct option:
   (i) Both A and R are true, and R is the correct explanation of A.
   (ii) Both A and R are true, but R is not the correct explanation of A.
   (iii) A is true, but R is false.
   (iv) A is false, but R is true.

## II. Answer the following questions:

4. Two miscible liquids, A and B, are present in a mixture. The boiling point of A is 60 °C and the boiling point of B is 90 °C. Suggest a method to separate them. Also, draw a labelled diagram of the method suggested.
5. Blood is an example of a colloidal mixture.
   (i) What would happen if blood behaved like a true suspension inside the body?
   (ii) In a blood sample, identify the dispersed phase and the dispersion medium.
6. Why is distillation an effective method for separating a mixture of water and acetone?

7. Solve the following problems:
   (i) A biscuit recipe uses dry ingredients, namely 75 g of sugar for 420 g of all-purpose flour and 5 g of sodium hydrogen carbonate. Express the concentration of each component in the mixture using an appropriate method.
   (ii) A brass alloy contains 70% copper by mass. Calculate the quantities of copper and zinc present in 240 g of brass.
8. Three students, A, B and C, are preparing sucrose solutions for an experiment:
   Student A dissolves 20 g of sucrose in 80 g of water.
   Student B dissolves 20 g of sucrose in 100 g of water.
   Student C dissolves 30 g of sucrose in 80 g of water.
   (i) Calculate the mass percentage (% m/m) concentration of sucrose in each student's solution.
   (ii) Whose solution is the most concentrated? Explain why?
9. Consider water as the solvent, and compounds 'A' and 'B' as the solutes. Each substance has a different solubility. A graph of solubility versus temperature is called a solubility curve. The solubility curves for 'A' and 'B' as solutes are shown in Fig. 5.6. The x-axis shows temperature (°C), whereas the y-axis indicates the solubility of the solute in grams per 100 g of water.

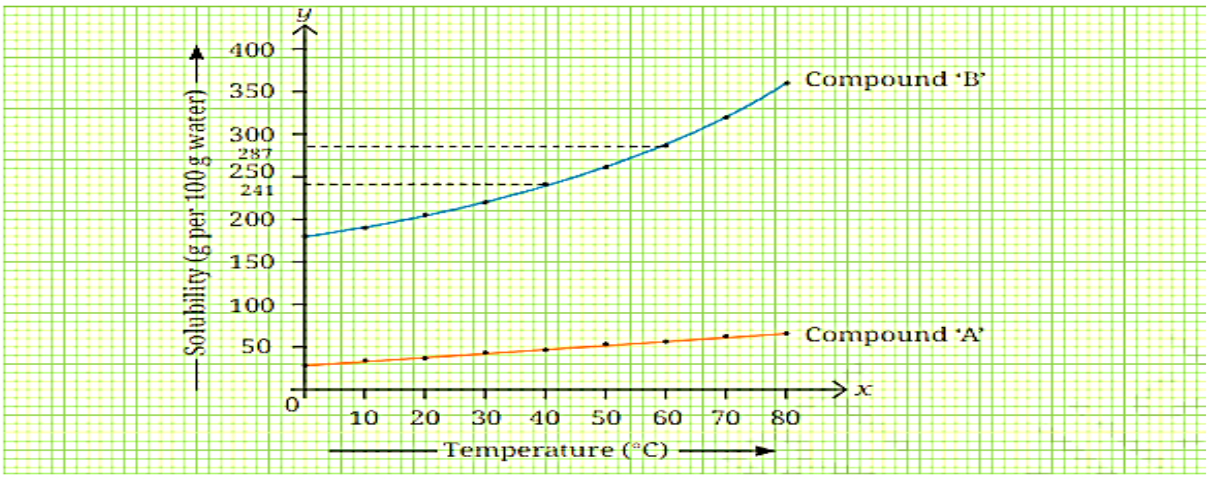


*Fig. 5.6: Solubility curves of compounds 'A' and 'B' in water*

   a) Based on the information from the above graph, predict which of the two compounds, 'A' or 'B', will dissolve more in a given amount of water at a given temperature?
   b) Observe Fig. 5.6 and fill in the blanks of the following statements:
      (i) The solubility of compound 'A' in water at 20 °C is _____ (less than/more than/similar to) its solubility at 60 °C.
      (ii) The solubility of compound 'B' at 20 °C is _____ (less than/ more than/similar to) its solubility at 60 °C.
      (iii) The solubility of _____ increases more than that of _____ with an increase in the temperature.

      What do you think will happen if you make a saturated solution at a higher temperature and cool it slowly?

10. If 4 mL of a liquid pesticide is mixed with a sufficient amount of water to form 200 mL of a pesticide spray for rice crop, calculate its volume by volume percentage.
11. If 5 g of Copper sulphate is dissolved in water to make 100 mL of solution, calculate its concentration in mass by volume percentage.
12. If 10 g of fructose is dissolved in 90 g of water, calculate the mass by mass percentage of the solution formed.