QUIZ: MIXTURE AND SEPARATION OF ITS COMPONENTS

1. Which of the following statement/(s) is/are correct regarding the mixture of milk in water in a proportion of 1:2?

1. It is a true solution.
2. It shows Tyndall effect.
3. It is a suspension.
4. It is colloidal solution.

(a) 1 & 4
(b) 2 & 3
(c) 2 & 4
(d) 1 & 3

2. The difference in boiling points of two immiscible liquids is 45°C. Which of the following is an appropriate technique to separate the two liquids from the mixture?

(a) Distillation
(b) Fractional distillation
(c) Sublimation
(d) Using separating funnel

3. A solution is made by dissolving 9.0 grams of common salt in water so as to get 150 grams of solution. The mass by mass percentage of the solution is.

(a) 6
(b) 9
(c) 12
(d) 4

4. A mixture consists of two solid components X and Y. On heating, X can be converted from solid to vapours directly. Both X and Y have approximately the same solubility in water. Which of the following is appropriate for the separation of X & Y from their mixture?

(a)Dissolution in water ⟶ Filtration ⟶ Evaporation
(b)Distillation

(c) Sublimation
(d) Fractional Distillation

5. A mixture contains two liquid components. The technique, of fractional distillation could be applied appropriately for their separation. Out of the four components given in the table, which two components could be present in the mixture?

	B.P./°C
1	80
2	342
3	218
4	57

(a) 1&3
(b) 1&2
(c) 1&4
(d) 2&3

Answers:

1. (c)
Options:
(a) A true solution is homogeneous but milk in water is heterogeneous. Only the property 4 in (a) is correct.
(b) Property 2 is shown by colloidal solution. Milk in water is not a suspension.
(c) Correct. Colloids show Tyndall effect due to its bigger particle size.
(d) Milk in water is neither a true solution nor a suspension due to its particle size.

Explanation:
The mixture of milk in water appears homogeneous due to the small particle size but it is heterogeneous. Therefore it shows Tyndall effect.

2. (d)
Options:

For (a), (b), & (c), as the two liquids are immiscible; they can be easily separated by using separating funnel instead of the complicated techniques of distillation, fractional distillation & sublimation.

Explanation:

As the two liquids are immiscible, they can be separated by using separating funnel.

Note for the teacher: Similar questions can be framed on other techniques of separation.

3. (a)

Explanation:

The mass by mass percentage of the solution is $\frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$

$= \frac{9}{150} \times 100 = 6$

Note for the teacher: A similar question may be framed on mass by volume percentage of a solution.

4. (c)

Options:

(a) Both X and Y have the same solubility in water. Therefore, technique (a) cannot be used.

(b) Distillation is used for separating the miscible liquid components.

(c) Correct. By using sublimation, the component X sublimes and gets separated from the mixture.

(d) Fractional distillation is used to separate liquids with small difference in their boiling points.

Note for the Teacher: A number of such questions based on different techniques of separation of the components of a mixture may be framed.

5. (c)

Explanation: The mixture containing two liquid components with a small difference in their boiling points (20-40 ^{0}C) can be separated by fractional distillation. The difference in boiling points between liquid 1 & 4 is 23^{0}C.