

Introduction to Colligative Properties (10 minutes)

Read the introduction to colligative properties and answer the following questions:

1. What are colligative properties?
2. What are the four main colligative properties of solutions?
3. Why are colligative properties important in everyday life?

Multiple Choice Questions (15 minutes)

Choose the correct answer for each question:

1. What is the definition of colligative properties?
 - a. Properties of solutions that depend on the concentration of the solute particles
 - b. Properties of solutions that depend on the identity of the solute particles
 - c. Properties of solutions that depend on the temperature of the solution
 - d. Properties of solutions that depend on the pressure of the solution
2. What is the effect of increasing the concentration of a solute on the vapour pressure of a solution?
 - a. The vapour pressure increases
 - b. The vapour pressure decreases
 - c. The vapour pressure remains the same
 - d. The vapour pressure becomes zero

Short Answer Questions (20 minutes)

Answer the following questions in complete sentences:

1. What is the formula for calculating the vapour pressure of a solution? Explain the variables used in the formula.
2. What is the importance of boiling point elevation in everyday life? Give an example.

Long Answer Questions (30 minutes)

Answer the following questions in complete sentences:

1. Explain the concept of colligative properties and their importance in understanding the behaviour of solutions.
2. Calculate the vapour pressure of a solution containing 10% glucose at 25°C. Use the formula $P = P_0 - (P_0 - P_1) \times (n_2 / (n_1 + n_2))$.

Activities (30 minutes)

Complete the following activities:

1. Design an experiment to measure the boiling point elevation of a solution containing 10% salt.
2. Research and present on a real-world application of colligative properties, such as the use of antifreeze in cars or the preservation of food through freezing.

Conclusion (10 minutes)

Summarize what you have learned about colligative properties and their importance in everyday life.

Individual Reflection:

1. What was the most surprising thing you learned about colligative properties?
2. How will this learning change your actions in the future?
3. What questions do you still have about colligative properties?

Glossary (10 minutes)

Define the following terms:

1. Colligative properties
2. Vapour pressure
3. Boiling point elevation
4. Freezing point depression
5. Osmotic pressure

References (10 minutes)

List the sources you used to research colligative properties:

- NCERT Chemistry Textbook for Class 12
- Chemistry: The Central Science by Theodore L. Brown, H. Eugene LeMay, and Bruce E. Bursten

