

Concentration and Colligative Properties



Here are 30 fill-in-the-blank questions based on the topics of concentration terms, dilute solutions, colligative properties, and Henry's law of ideal solutions:

1. **Molarity (M)** is defined as the number of moles of solute per _____ of solution.
2. **Molality (m)** is the number of moles of solute per _____ of solvent.
3. **Normality (N)** is the number of gram equivalents of solute per _____ of solution.
4. The mole fraction of a solute is the ratio of the moles of solute to the total number of moles of _____ and solvent.
5. The percentage by mass of a solute is calculated as the mass of solute divided by the total _____ of the solution, multiplied by 100.
6. The percentage by volume is the volume of solute divided by the total _____ of the solution, multiplied by 100.
7. The **density** of a solution is its mass per unit _____.
8. In a dilute solution, the _____ of the solvent is much larger than that of the solute.
9. Colligative properties depend on the number of solute _____ in solution, not their nature.
10. **Boiling point elevation** is a colligative property that occurs when a _____ solute is added to a solvent.
11. **Freezing point depression** happens when a non-volatile solute is added, lowering the _____ point of the solvent.
12. The osmotic pressure of a solution is directly proportional to the solute _____ and temperature.
13. **Vapor pressure lowering** is observed when a solute is added, causing the solvent's vapor pressure to _____.
14. Raoult's law states that the vapor pressure of an ideal solution is directly proportional to the _____ of the solvent.
15. The boiling point of a solution is higher than that of the _____ solvent.
16. The freezing point of a solution is _____ than that of the pure solvent.
17. The van't Hoff factor (i) accounts for the dissociation or association of solute particles in _____ solutions.
18. Henry's law states that the solubility of a gas in a liquid is proportional to the _____ of the gas above the liquid.
19. According to Henry's law, increasing the pressure of a gas will _____ its solubility in a liquid.
20. Henry's law constant varies with the nature of the gas and the _____ of the solvent.
21. For an ideal solution, the interactions between solute and solvent are similar to those between the _____ molecules.
22. An ideal solution follows Raoult's law at all _____ and concentrations.
23. For non-ideal solutions, there is a deviation from Raoult's law due to _____ or repulsive forces between molecules.
24. In positive deviation from Raoult's law, the vapor pressure of the solution is _____ than expected.
25. In negative deviation from Raoult's law, the vapor pressure of the solution is _____ than expected.
26. A hypertonic solution has a _____ solute concentration than the solution it is compared to.
27. A hypotonic solution has a _____ solute concentration compared to another solution.

28. Osmosis is the movement of solvent particles from a _____ solution to a concentrated solution through a semipermeable membrane.
29. A solution's osmotic pressure is used to determine the molecular _____ of the solute.
30. Non-electrolytes in solution do not dissociate into _____, unlike electrolytes which do.

These questions should cover a variety of aspects within the topics requested. Let me know if you'd like any adjustments or additional information.