

AP MULTIPLE CHOICE QUESTIONS
CH. 13, SET 1

1994

14. Which of the following is lower for a 1.0 molar aqueous solution of any solute than it is for pure water?
- (A) pH
(B) vapor pressure
(C) freezing point
(D) Electrical conductivity
(E) absorption of visible light
16. Commercial vinegar was titrated with NaOH solution to determine the content of acetic acid, $\text{HC}_2\text{H}_3\text{O}_2$. For 20.0 mL of the vinegar, 26.7 mL of 0.600 M NaOH solution was required. What was the concentration of acetic acid in the vinegar if no other acid was present?
- (A) 1.60 M (D) 0.450 M
(B) 0.800 M (E) 0.200 M
(C) 0.600 M
26. Which of the following actions would be likely to change the boiling point of a sample of a pure liquid in an open container?
- I. Placing it in a smaller container
II. Increasing the number of moles of the liquid in the container
III. Moving the container and liquid to a higher altitude.
- (A) I only (D) II and III only
(B) II only (E) I, II and III
(C) III only
28. Given that a solution is 5 percent sucrose by mass, what additional information is necessary to calculate the molarity of the solution?
- I. The density of water
II. The density of the solution
III. The molar mass of sucrose
- (A) I only (D) I and III
(B) II only (E) II and III
(C) III only
37. A sample of 3.30 g of an ideal gas at 150.0°C and 1.25 atm pressure has a volume of 2.00 L. What is the molar mass of the gas? ($R=0.0821 \text{ L atm mol}^{-1} \text{ K}^{-1}$)
- (A) 0.0218 g/mol (D) 45.8 g/mol
(B) 16.2 g/mol (E) 71.6 g/mol
(C) 37.0 g/mol

44. Which of the following solutions has the lowest freezing point?
- (A) 0.20 m $\text{C}_6\text{H}_{12}\text{O}_6$, glucose
(B) 0.20 m NH_4Br
(C) 0.20 m ZnSO_4
(D) 0.20 m KMnO_4
(E) 0.20 m MgCl_2

1989

27. I. Difference in temperature between freezing point of solvent and freezing point of solution.
II. Molal freezing point depression constant K_f , for solvent.
- In addition to the information above, which of the following gives the minimum data required to determine the molecular mass of a nonionic substance by the freezing point depression technique?
- (A) No further information is necessary.
(B) mass of solute
(C) mass of solute and mass of solvent
(D) mass of solute and volume of solvent
(E) mass of solute, mass of solvent and vapor pressure of solvent
28. Which of the following is probably true for a solid solute with a highly endothermic heat of solution when dissolved in water?
- (A) The solid has a low lattice energy.
(B) As the solute dissolves, the temperature of the solution increases.
(C) The solid is more soluble at higher temperatures.
(D) The resulting solution is ideal.
(E) The solid has a high energy of hydration.