

## Electrical conductors, Arrhenius theory and Ostwald's dilution law

1. Which of the following is non-electrolyte
  - (a)  $NaCl$
  - (b)  $CaCl_2$
  - (c)  $C_{12}H_{22}O_{11}$
  - (d)  $CH_3COOH$
2. Ammonium hydroxide is a
  - (a) Strong electrolyte
  - (b) Weak electrolyte
  - (c) Both under different conditions
  - (d) Non-electrolyte
3. Ammonium hydroxide is a weak base because
  - (a) It has low vapour pressure
  - (b) It is only slightly ionized
  - (c) It is not a hydroxide of any metal
  - (d) It has low density
4. Electrolytes when dissolved in water dissociate into their constituent ions. The degree of dissociation of an electrolyte increases with
  - (a) Increasing concentration of the electrolyte
  - (b) Decreasing concentration of the electrolyte
  - (c) Decreasing temperature
  - (d) Presence of a substance yielding a common ion
5. An electrolyte
  - (a) Gives complex ions in solution
6. Dissolves in water to give ions
  - (b) Dissolves in water to give ions
  - (c) Is ionized in the solid state
  - (d) Generates ions on passing electric current
7. A monoprotic acid in 1.00 M solution is 0.01% ionised. The dissociation constant of this acid is
  - (a)  $1 \times 10^{-8}$
  - (b)  $1 \times 10^{-4}$
  - (c)  $1 \times 10^{-6}$
  - (d)  $10^{-5}$
8. Molten sodium chloride conducts electricity due to the presence of
  - (a) Free electrons
  - (b) Free ions
  - (c) Free molecules
  - (d) Atoms of sodium and chlorine
9. An example for a strong electrolyte is
  - (a) Urea
  - (b) Ammonium hydroxide
  - (c) Sugar
  - (d) Sodium acetate
10. Which one is strongest electrolyte in the following
  - (a)  $NaCl$
  - (b)  $CH_3COOH$
  - (c)  $NH_4OH$
  - (d)  $C_6H_{12}O_6$
11. The equivalent conductance at infinite dilution of a weak acid such as  $HF$



- (a) Can be determined by measurement of very dilute  $HF$  solution  
 (b) Can be determined by extrapolation of measurements on dilute solutions of  $HCl$ ,  $HBr$  and  $HI$   
 (c) Can best be determined from measurements on dilute solutions of  $NaF$ ,  $NaCl$  and  $HCl$   
 (d) Is an undefined quantity
11. If  $\alpha$  is the degree of ionization,  $C$  the concentration of a weak electrolyte and  $K_a$  the acid ionization constant, then the correct relationship between  $\alpha$ ,  $C$  and  $K_a$  is  
 (a)  $\alpha^2 = \sqrt{\frac{K_a}{C}}$       (b)  $\alpha^2 = \sqrt{\frac{C}{K_a}}$   
 (c)  $\alpha = \sqrt{\frac{K_a}{C}}$       (d)  $\alpha = \sqrt{\frac{C}{K_a}}$
12. Theory of ionization was given by  
 (a) Rutherford      (b) Graham  
 (c) Faraday      (d) Arrhenius
13. An ionizing solvent has  
 (a) Low value of dielectric constant  
 (b) High value of dielectric constant  
 (c) A dielectric constant equal to 1  
 (d) Has a high melting point
14. The extent of ionization increases  
 (a) With the increase in concentration of solute  
 (b) On addition of excess water to solution  
 (c) On decreasing the temperature of solution  
 (d) On stirring the solution vigorously
15. Which is generally true about ionic compounds  
 (a) Have low boiling point  
 (b) Have low melting point  
 (c) Soluble in non polar solvents  
 (d) Conduct electricity in the fused state
16. At infinite dilution, the percentage ionisation for both strong and weak electrolytes is  
 (a) 1%      (b) 20%  
 (c) 50%      (d) 100%
17. The degree of ionization of a compound depends on  
 (a) Size of solute molecules  
 (b) Nature of solute molecules  
 (c) Nature of vessel used  
 (d) Quantity of electricity passed
18. For a weak acid  $HA$ , Ostwald's dilution law is represented by the equation  
 (a)  $K_a = \frac{\alpha c}{1-\alpha^2}$       (b)  $K_a = \frac{\alpha^2 c}{1-\alpha}$



$$(c) \alpha = \frac{K_a c}{1-c} \quad (d) K_a = \frac{\alpha^2 c}{1-\alpha^2}$$

19. Acetic acid is a weak electrolyte because
- (a) Its molecular weight is high
  - (b) It is covalent compound
  - (c) It does not dissociate much or its ionization is very less
  - (d) It is highly unstable
20. In which of the following dissociation of  $NH_4OH$  will be minimum
- (a)  $NaOH$
  - (b)  $H_2O$
  - (c)  $NH_4Cl$
  - (d)  $NaCl$

