CET QUESTIONS ON ELECTROCHEMISTRY

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1. Electrolytic and metallic conductance differs from

1. Electrolytic and metallic conductance increases with increase of temperature

2. Electrolytic conductance increases and metallic conductance decreases with increase of temperature

3. Electrolytic conductance decreases and metallic conductance remains constant with increase of temperature

4. Electrolytic and metallic conductance decreases with increase of temperature

2. **When a current of 1.25 ampere flows through the solution of chromium (III) sulphate, 1.3 g of chromium is deposited at the cathode in _____ time**

(At mass of Cr=52)

1. 108 min.
2. 9.65 min.
3. 96.5 min.
4. 52 min.

3. The time required to liberate 89 cm^3 of H$_2$ gas at STP if 7 ampere current flows is

1. 109.54 sec.
2. 19.9 sec.
3. 10.954 sec.
4. 101.1 sec.

4. Mathematical statement of Faraday's second law is

1. $W_1/E_2 = W_2/E_1$
2. $E_1/W_2 = E_2/W_1$
3. $E_2/W_1 = E_1/W_2$
4. $W_1/W_2 = E_1/E_2$

5. Same quantity of electric current is passed through the solutions of $CuSO_4$ and $AgNO_3$, 32 g of Cu is deposited at the cathode in first case. The mass of Ag deposited in second case will be

1. 32 g   2. 108 g   3. 10.8 g   4. 320 g

6. Of the followings, which one is conjugate acid and base

1. H_2SO_4 and HSO_4^{-1}
2. H_2SO_4 and HCl
3. HNO_3 and $H3O^+$
4. H_2CO_3 and $H3O^+$

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7. In an electrolytic cell, electrons move from

1. Cathode to anode
2. Anode to cathode
3. Cation to anion
4. Anion to cation

8. Which among the followings is

amphoprotic?

1. H_2SO_4

2. SO_4^{-2}

3. H_3O^+

4. $H_2PO_4^{-1}$

9. Molar conductance and equivalent conductance are same for the electrolyte having

1. Same molecular mass and empirical formula mass
2. Different molecular mass and empirical formula mass
3. Different molecular mass and equivalent mass
4. Same molecular mass and equivalent mass

10. The conjugate base of OH^- is

1. H_2O
2. O^{-2}
3. H_3O^+
4. OH^+

11. If an acid is weak, its conjugate base is

1. Strong or weak
2. Weak
3. Neutral
4. Strong

12. For conjugate acid-base pairs

1. $P^{ka} + P^{kb} = 0$
2. $P^{ka} + P^{kb} = 14$
3. $P^{ka} - P^{kb} = 0$
4. $P^{ka} = P^{H}$

13. When the same quantity of current is passed through silver salt and gold salt solutions deposited 0.583 g of Ag and 0.35 g of Au. The oxidation state of Au in its salt is At mass of Au = 197, Eq. mass of Ag = 108

1. +1   2.+2   3. +4   4. +3

14. **The degree of dissociation of a weak electrolyte increases**

1. On increasing pressure
2. On increasing dilution
3. On adding strong electrolyte containing common ions
4. On decreasing dilution

15. The Pk_a values of acetic acid, benzoic acid and formic acid are 4.757, 4.257 and 3.752, respectively. Among these acids, which is stronger?

1. Acetic acid   2. Formic acid
3. Benzoic acid   4. none

16. At 90°C, pure water has concentration of H_3O^+ = 1 x 10^{-6} M. The value of k_w at the same temperature is

1. 10^{-6}
2. 10^{-12}
3. 10^{-14}
4. 10^{-7}

17. Sodium is added to a solution of acetic acid. Then P^H of solution

1. Decreases
2. Increases
3. Unchanged
4. Changed

18.The P^H of 10^{-8} molar aqueous solution of HCl is

1. 8
2. -6
3. 6 to 7
4. 7 to 8

19. More acid is added to solution of $P^H = 5$ in order to reduce the $P^H = 2$. The increase in H^+ ion concentration is

1. 100 times
2. 3 times
3. 5 times
4. 1000 times

20. Which pair will show common ion effect?

1. $BaCl_2 + Ba(NO_3)_2$
2. $NaCl + HCl$
3. $CH_3\text{-}COOH + NaOH$
4. $NH_4\text{-}OH + NH_4Cl$

21 Which of the salt solution would be acidic?

1. Na_2SO_4
2. $NaHSO_3$
3. K_2SO_4
4. Na_2SO_3

22. Which of the following cannot be considered as Lewis acid?

1. H^+
2. $AlCl_3$
3. NH_4^+
4. BF_3

23. Which of the following pair is Lewis base as well as Bronstead base?

1. NH_3 and H_2O
2. $NaOH$ and NH_3
3. $NaOH$ and HCl
4. NH_3 and BF_3

24. Which of the following does not make any change in P^H, when added to 10 ml dilute HCl?

1. 5 ml pure water
2. 20 ml pure water
3. 10 ml HCl
4. 20 ml same dilute HCl

25. k_a of acetic acid is 1.8×10^{-5}. If the ratio of concentration of salt to acid is 1 M, them P^H of the solution is

1. 3.7
2. 4.7
3. 5.3
4. 1.4

26. In an electroplating, the article to be electroplated acts as

1. Cathode
2. Electrolyte
3. Anode
4. Conductor

27. P^H of a mixture of two solutions of P^H 3 and 4, in the ratio 1:4 is

1. 3.8
2. 3.2
3. 3.55
4. 3.5

28. P^H of the solution produced when an equal volume of solutions having $P^H = 5$ and $P^H = 4$ are mixed, is

1. 4.3
2. 4.04
3. 3.5
4. 3.56

29. **The P^H of solution produced by mixing 250 cm^3 of a solution of P^H 3 and 750 cm^3 of a solution P^H 5 is**

1. **4.5**

2. **4**

3. **3.3**

4. **3.6**

30. The buffer action of blood is due to the presence of

1. HCl and NaCl
2. Amino acids and NH_3
3. Urea and Na^+
4. Bicarbonate ions and carbonic acid

31. A solution of ammonium acetate is neutral because

1. both the acid and base forming a salt are weak electrolytes

2. both the acid and base forming a salt are strong electrolytes

3. dissociation constants of weak acid and weak base are same

4. ammonium acetate does not undergo hydrolysis

32. **A solution is called super-saturated if**

1. **Ionic product > solubility product**
2. **Ionic produce < solubility product**
3. **Ionic produce = solubility product**
4. **None of the above**

33. **In an electro-chemical cell,**

1. electrical energy is converted into chemical energy

2. chemical energy is converted into electrical energy

3. chemical energy is converted into heat

4. electrical energy is converted into heat

34.The hydrogen electrode is dipped in a solution of P^H 3 at 25°C. The potential attained by it is

1. 0.177 V

2. -0.177 V

3. 0.087 V

4. 0.0591 V

35. **Magnesium can be used to protect iron structures from corrosion, since**

    1. magnesium is less electropositive element

    2. magnesium is light metal

    3. magnesium is cheap

    4. magnesium acts as anode and get oxidised in preference to iron

36. **emf of the cell is measured accurately using**

1. voltmeter   **2. potentiometer**

3. Galvanometer   4. Ammeter

37. Aluminium is more reactive than iron. But aluminium is less easily corroded than ion

1. Aluminium is p-block element

2. Aluminium forms a protective oxide film over its surface

3. Iron reacts easily with water

4. Iron forms both divalent and trivalent ions

38. **For sparingly soluble salt of the type A_2B, solubility and solubility product are related as**

1. $k_{sp} = S^3$

2. $k_{sp} = S^2$

3. $k_{sp} = \sqrt{S^3}$

4. $k_{sp} = 4S^3$

39. Second group metal sulphides have ___ solubility product

1. Smaller
2. Larger
3. Equal
4. None

40.In SHE platinised platinum foil is used because

1. It prevents poisoning
2. It prevents reaction of metal with HCl
3. It increases efficiency of adsorption of H_2
4. It prevents reaction of metal with the external wire

41. In an electro-chemical cell, current move from

1. Anode to cathode
2. Cathode to anode
3. Cation to anion
4. Anion to cation

42. Arrangement of metals Al, Cu, Fe, Mg and Zn in the order which they displace each other. Given that E^0Mg = -2.37V, E^0Al = -1.66V, E^0Cu = +0.34V, E^0Fe=-0.44V and E^0Zn = -0.76V

1. **Mg>Al>Zn>Fe>Cu**

2. **Mg>Al>Zn>Cu>Fe**

3. **Al>Zn>Mg>Fe>Cu**

4. **Mg>Zn>Al>Fe>Cu**

43. The potential of copper electrode dipped in 0.1 M $CuSO_4$ solution at 25°C is [Given E^0_{Cu} = 0.34V]

1. 0.34V
2. 0.31V
3. 0.349V
4. 0.28V

44. The relation between standard free energy change and standard emf of the cell is

1. ΔG^0 = -nEcell

2. ΔG^0 = -nFE^{0}cell

3. ΔG = nFEcell

4. ΔG^0 = $\dfrac{nF}{E^0 cell}$

45.The maximum work done from the Daniel cell, if its E^0cell is 1.1 volt. [Zn|Zn^{+2}(1M) || Cu^{+2} (1M)|Cu]

1. -2.12 kJ   2.   21.23 kJ

3. -212.3 kJ   4.   2123 kJ

46. Cell reaction is spontaneous, when

1. E^0_{red} is positive
2. ΔG^0 is positive
3. E^0_{red} is negative
4. ΔG^0 is negative

47. The ksp of CuS, Ag_2S and HgS are 10^{-31}, 10^{-44} and 10^{-54}, respectively.

Which sulphide is ppted earlier?

1. CuS 2. Ag_2S

3. HgS 4. All the sulphides

48. Solubility product of a sparingly soluble salt AX_2 is 3.2×10^{-11}. Its solubility in mol|dm^3 is

1) 5.6×10^{-6}

2) 3.1×10^{-4}

3) 2×10^{-4}

4) 4×10^{-4}

49. **The dissociation constants of formic acid and acetic acid are 1.77 x 10-4 and 1.77 x 10-5, respectively. The relative strengths of two acids is**

1. 3.18
2. 100
3. 6.36
4. 5

50. Buffer capacity of buffer solution is maximum when

1. $P^H = 0$

2. [salt] / [acid] = 1

3. [salt] > [acid]

4. [salt] < [acid]

THANK YOU

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