

Class : XIIth
Date :

Subject : CHEMISTRY
DPP No. : 4

Topic :- Electro Chemistry

- The relationship between Gibbs' free energy change (ΔG) and emf (E) of a reversible electrochemical cell is given by
a) $\Delta G = nFE$ b) $\Delta G = nF/E$ c) $\Delta G = -nFE$ d) $\Delta G = E/nF$
- The reduction electrode potential, E of 0.1 M solution of M^+ ions ($E_{RP} = -2.36 V$) is
a) -4.82 V b) -2.41 V c) +2.41 V d) None of these
- Passage of 1 faraday of electricity through a solution of $CuSO_4$, deposits :
a) 1 mole of Cu b) 1 g-atom of Cu c) 1 molecule of Cu d) 1 g equivalent of Cu
- The conductivity of $N/50$ solution of KCl in a cell at 25°C is 0.002765 mho cm^{-1} . If the resistance of a cell containing this solution is 400 ohm, the cell constant is :
a) 1.106 cm b) 1.106 cm^{-1} c) 1 cm d) 1 cm^{-1}
- The equilibrium constant for the reaction given below at 298 K is :
 $Zn(s) + Fe^{2+}(aq) \rightarrow Zn^{2+}(aq) + Fe(s)$;
 $E_{cell}^{\circ} = 2905 V$ at 298 K
a) $e^{0.32/0.0295}$ b) $10^{0.595/0.76}$ c) $10^{0.0250/0.32}$ d) $10^{0.32/0.295}$
- When the sample of copper with zinc impurity is to be purified by electrolysis, the appropriate electrodes are

Cathode	Anode
a) Pure zinc	pure copper
b) Impure sample	pure copper
c) Impure zinc	impure sample
d) Pure copper	impure sample
- A current of 12 A is passed through an electrolytic cell containing aqueous $NiSO_4$ solution. Both Ni and H_2 gas are formed at the cathode. The current efficiency is 60%. What is the mass of nickel deposited on the cathode per hour?
a) 7.883 g b) 3.941 g c) 5.91 g d) 2.645 g
- 10^{-2} g atom of Ag can be oxidised to Ag^+ during the electrolysis of $AgNO_3$ solution using silver electrode by :
a) 965 coulomb b) 96500 coulomb c) 9650 coulomb d) 96.500 coulomb
- A gas X at 1 atm is bubbled through a solution containing a mixture of 1 M y^- and 1 M z^- at 25°C. If the order of reduction potential is $z > y > x$ then
a) y will oxidize x and not z b) y will oxidize x and z
c) y will oxidize z and not x d) y will reduce both x and z

10. Which one of the following solutions will have highest conductivity?
 a) 0.1 M CH_3COOH b) 0.1 M NaCl c) 0.1 M KNO_3 d) 0.1 M HCl
11. A current of strength 2.5 A was passed through CuSO_4 solution for 6 min 26 s. The amount of copper deposited is (At. Wt. of $\text{Cu} = 63.5$, $1F = 96500 \text{ C}$)
 a) 0.3175 g b) 3.175 g c) 0.635 g d) 6.35 g
12. A student made the following observations in the laboratory,
 i) Clean copper metal did not react with 1 molar $\text{Pb}(\text{NO}_3)_2$ solution.
 ii) Clean lead metal dissolved in a 1 molar AgNO_3 solution and crystals of Ag metal appeared.
 iii) Clean silver metal did not react with 1 molar $\text{Cu}(\text{NO}_3)_2$ solution.
 The order of decreasing reducing character of the three metals is :
 a) Cu, Pb, Ag b) Cu, Ag, Pb c) Pb, Cu, Ag d) Pb, Ag, Cu
13. The e. m. f. of the cell $\text{Zn} | \text{Zn}^{2+} (1 \text{ M}) || \text{Cu}^{2+} | \text{Cu} (1 \text{ M})$ is 1.1 volt. If the standard reduction potential of $\text{Zn}^{2+} | \text{Zn}$ is -0.78 volt, what is the oxidation potential of $\text{Cu} | \text{Cu}^{2+}$?
 a) $+1.86 \text{ V}$ b) 0.32 V c) -0.32 V d) -1.86 V
14. Standard reduction electrode potentials of three metals A, B and C are respectively $+0.5 \text{ V}$, -3.0 V and -1.2 V . The reducing powers of these metals are
 a) $A > B > C$ b) $C > B > A$ c) $A > C > B$ d) $B > C > A$
15. Quantity of charge is measured in :
 a) ampere-sec. b) ampere c) ampere sec^{-1} . d) ampere $^{-1}$ sec.
16. Which of the following will form a cell with the highest voltage?
 a) $0.1 \text{ M Ag}^+, 2 \text{ M Co}^{2+}$ b) $2 \text{ M Ag}^+, 2 \text{ M Co}^{2+}$ c) $1 \text{ M Ag}^+, 1 \text{ M Co}^{2+}$ d) $2 \text{ M Ag}^+, 0.1 \text{ M Co}^{2+}$
17. When electric current is passed through acidified water for 1930 s, 1120 mL of H_2 gas is collected (at STP) at the cathode. What is the current passed in amperes?
 a) 0.05 b) 0.50 c) 5.0 d) 50
18. In which of the following pairs, the constants/ quantities are not mathematically related to each other?
 a) Gibbs free energy and standard cell potential
 b) Equilibrium constant and standard cell potential
 c) Rate constant and activation energy
 d) Rate constant and standard cell potential
19. The charge required for reduction of 1 mole of $\text{Cr}_2\text{O}_7^{2-}$ ions to Cr^{3+} is
 a) 96500 C b) $2 \times 96500 \text{ C}$ c) $3 \times 96500 \text{ C}$ d) $6 \times 96500 \text{ C}$
20. Cell constant has the unit:
 a) cm b) cm^{-1} c) cm^2 d) cm sec^{-1}