

DAV CENT. PUBLIC SCHOOL, MEERUT

CHEMISTRY ASSIGNMENT (2019-20)

(ELECTROCHEMISTRY)

1. Write Nernst equation and emf of cell at 298 K.



$$\left[E^0_{\text{Cu}^{++}/\text{Cu}} = 0.34\text{V} \right] \quad \left[E^0_{\text{Ag}^+/\text{Ag}} = 0.80\text{V} \right]$$

2. What is the role of ZnCl_2 in dry cell ?
3. Why is the cell potential of mercury cell remain constant (1.35V) ?
4. Calculate K_c and ΔG^\ominus for the reaction at 298 K.
 $\text{Zn(s)} + \text{Cu}^{++} (\text{aq}) \rightleftharpoons \text{Zn}^{++} (\text{aq}) + \text{Cu (s)}$
- $$\left[E^0_{\text{Zn}^{++}/\text{Zn}} = -0.76\text{V} \right] \quad \left[E^0_{\text{Cu}^{++}/\text{Cu}} = 0.34\text{V} \right]$$
5. Define molar conductivity.
6. State two differences between electrolyte and electrochemical cell.
7. What mass of zinc can be produced by the electrolysis of ZnSO_4 when a steady current of 0.015A is passed for 15 minutes ? (At mass of Zn = 65.4u).
8. How many coulombs are required for the oxidation of 1 mol H_2O to O_2 .
9. The electrical resistance of a column of 0.05 M NaOH solution of diameter 1 cm and length 50 cm is $5.55 \times 10^3 \Omega$. Calculate its resistivity, conductivity and molar conductivity.
10. The molar conductivity is 0.025 HCOOH is $45.15 \text{ S cm}^2 \text{ mol}^{-1}$. Calculate its degree of dissociation and dissociation constant. (Given $\wedge^0_m(\text{HCOO}^-) = 54.6 \text{ S cm}^2 \text{ mol}^{-1}$)
11. Why does the conductivity of solution decreases with dilution ?
12. Suggest a list of metals which can be extracted electrolytically.
13. Predict the products of electrolysis of an aqueous solution of CuCl_2 using Pt electrodes.
14. State two advantages of fuel cells.
15. Write chemical reactions take place in lead storage battery.
16. What is over voltage ?
17. Write relationship between cell constant (G^*) and conductivity (K).
18. Why is not possible to determine \wedge^0_m for CH_3COOH experimentally ?
19. Why does alkaline medium inhibited rusting ?
20. Explain Faraday laws of electrolysis.
21. Why do rusting rapid in saline water ?
22. Why do dry cell become dead after sometime when not in used ?
23. Write Debye-Huckel Onsager equation.
24. Calculate the mass of Ag deposited when a current 2A was passed through for 15 minutes.

DAV CENT. PUBLIC SCHOOL, MEERUT**CHEMISTRY ASSIGNMENT (2019-20)****(SOLUTIONS)**

1. A solution of glucose (molar mass = 180 u) in water labeled as 10% (by mass). What'd be the molarity and molality of the solution ? Given that the density of the solution is 1.2 g mL^{-1} .
2. Find the molarity and molality of a 15% solution w/w of H_2SO_4 . (density of $\text{H}_2\text{SO}_4 = 1.02 \text{ g cm}^{-3}$).
3. What role does the molecular interaction play in the mixture of solution of ethyl alcohol and water ?
4. The vapour pressure of pure water at 20°C is 17.5 mm of Hg. A solution of sucrose is prepared by dissolving 68.4 g of sucrose in 1000 g of water. Calculate vapour pressure of solution.
5. Calculate the molal elevation constant for water given that 0.2 molal solution of non-volatile solute increases the boiling point of water by 0.104 K.
6. Calculate the freezing point of an aqueous solution containing 10.5 g of MgBr_2 in 200 g of water. K_f for water = $1.86 \text{ K kg mol}^{-1}$.
7. Calculate the freezing point of a solution containing 8.1 g of HBr in 100 g of water assuming that the acid is 90% ionized. K_f for $\text{H}_2\text{O} = 1.86 \text{ K kg mol}^{-1}$.
8. What are hypertonic and hypotonic solutions ?
9. What is Anoxia ?
10. What is the significance of Henry law constant (K_H) ?
11. Write relationship among molarity, molality and density.
12. What is an antifreeze ?
13. Define molal elevation constant.
14. What is the value of Vant Hoff factor for $\text{K}_4[\text{Fe}(\text{CN})_6]$ when it completely dissociates in H_2O ?
15. Why does the solubility of NaCl in H_2O increases with rise of temp ?
16. Why does the vapour pressure of liquid decreases when a non-volatile solute is added to it ?
17. Which type of solution form ideal solution ?
18. How is ΔT_b related to molar mass of solute ?