



Sarvan Sir- Chemistry for ALL

JEE/NEET/CBSE

Electrochemistry - Theory questions

1. Define a **Galvanic (Voltaic) cell**.
2. Write the **chemical reactions** occurring in a **Daniell cell**. Also write the **anode and cathode reactions**.
3. Write the **formula to calculate the standard cell potential (E°)** of a galvanic cell.
4. Write the **Nernst equation** to calculate the **cell potential of a galvanic cell**.
5. What is the **Standard Hydrogen Electrode (SHE)**?
6. What is the **function of a salt bridge** in a galvanic cell?
7. What is the **relationship between standard reduction potential (SRP)** and the **oxidising and reducing strength** of a substance?
8. Write the **formulae to calculate Gibbs free energy change (ΔG°)** and the **equilibrium constant (Kc)**.
9. Define an **electrolytic cell**.
10. Define **conductance** and write its **unit**.
11. Define **conductivity (specific conductance)** and write its **unit**.
12. Define **molar conductivity** and write its **unit**.
13. Define **cell constant** and write its **unit**.
14. Why does **conductivity decrease on dilution**?
15. **Molar conductivity increases on dilution**.
Explain this behaviour for **strong and weak electrolytes**, with the help of **graphs**.
16. Define **limiting molar conductivity**.
17. State **Kohlrausch's Law of independent migration of ions** and write its **applications**.
18. State **Faraday's First and Second Laws of Electrolysis**.
19. Write the **products of electrolysis** of the following by using **platinum electrodes**:
 - Molten NaCl
 - Aqueous NaCl
 - Aqueous CuCl_2
 - Aqueous AgNO_3
 - Aqueous H_2SO_4
20. Write the **products of electrolysis of aqueous AgNO_3** when **silver electrodes** are used.
21. Define **primary and secondary batteries** with **examples**.
22. Explain the **construction and working of a dry cell**. Also write its **uses**.
23. Explain the **construction and working of a mercury cell**. Write its **uses**.
24. Why does the **voltage of a mercury cell remain constant throughout its life**?



Sarvan Sir- Chemistry for ALL

JEE/NEET/CBSE

25. Explain the **charging and discharging processes of a lead storage battery**. Write its **uses**.
26. Define a **fuel cell**. Explain the **working of a hydrogen–oxygen fuel cell**.
27. Why are **fuel cells considered a better source of energy**?
28. Define **corrosion**. Explain the **mechanism of rusting of iron**.
29. How can **rusting of iron be prevented**?

Electrochemistry – Additional Theory Questions

Galvanic Cells & Electrode Potential

1. Why is a galvanic cell also called a **Voltaic cell**?
2. Why cannot the two half-cells of a galvanic cell be kept in direct contact?
3. Why is the **salt bridge** filled with **KCl** or **KNO₃** solution?
4. What happens to the **cell potential** when the reaction reaches equilibrium?
5. Why is the **standard hydrogen electrode assigned zero potential**?
6. Why is platinum used as an electrode in SHE?
7. What is meant by **electrode potential**?
8. What is meant by **standard electrode potential**?
9. Why are **standard electrode potentials always written as reduction potentials**?
10. Why does oxidation occur at the anode and reduction at the cathode?

Nernst Equation & Thermodynamics

11. Write the **Nernst equation for a half-cell reaction**.
12. How does **cell potential vary with concentration** of electrolytes?
13. What is the effect of **temperature on cell potential**?
14. What is the significance of $\Delta G^\circ < 0$ for a galvanic cell reaction?
15. What does a **large positive value of E°_{cell}** indicate?
16. Why is a reaction spontaneous when **E°_{cell} is positive**?

Conductance & Conductivity

17. Why is **conductance not a characteristic property**, whereas conductivity is?
18. Why is **conductivity expressed in S m⁻¹**?
19. What factors affect the **conductivity of an electrolyte**?
20. How does conductivity vary with **temperature**?



Sarvan Sir- Chemistry for ALL

JEE/NEET/CBSE

21. Why does conductivity of pure water increase on adding an electrolyte?
 22. Why is **AC current preferred** over DC for conductivity measurements?
-

Molar Conductivity & Kohlrausch's Law

23. Why is **molar conductivity very high at infinite dilution**?
 24. Why cannot limiting molar conductivity of weak electrolytes be determined experimentally?
 25. How is **Kohlrausch's law used to calculate limiting molar conductivity**?
 26. How can the **degree of dissociation** of a weak electrolyte be calculated using molar conductivity?
 27. How can **dissociation constant (K_a)** be calculated using conductivity data?
 28. State the **limitations of Kohlrausch's law**.
-

Electrolysis & Faraday's Laws

29. Why does electrolysis not occur in the absence of an electrolyte?
 30. What is meant by **overvoltage**?
 31. Why does NaCl not undergo electrolysis in the solid state?
 32. Why is hydrogen gas liberated during electrolysis of aqueous acids?
 33. What is the significance of **Faraday constant**?
 34. How are Faraday's laws related to **stoichiometry**?
-

Batteries & Fuel Cells

35. Why are **primary cells not rechargeable**?
 36. Why is a dry cell called a **primary cell**?
 37. Why is lead storage battery called a **secondary battery**?
 38. Why is sulfuric acid used as electrolyte in lead storage battery?
 39. Why are fuel cells considered **eco-friendly**?
 40. Why is hydrogen used as fuel in fuel cells?
-

Corrosion



Sarvan Sir- Chemistry for ALL

JEE/NEET/CBSE

41. Why is corrosion considered an **electrochemical process**?
 42. Why does rusting occur faster in **coastal areas**?
 43. Why does iron rust faster in **acidic medium**?
 44. Why is rusting faster at **high temperature**?
 45. What is **galvanic corrosion**?
 46. Why does painting prevent rusting?
 47. Why is zinc used for **galvanisation** of iron?
-

HOTS Type

48. Why does a strong electrolyte show **small increase in molar conductivity on dilution**?
 49. Why does a weak electrolyte show **sharp increase in molar conductivity on dilution**?
 50. Why is a fuel cell called a **continuous source of electrical energy**?
-

