Chemistry Grade 10 — Chapter 4

Electrochemistry

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Independent practice MCQs from the supplied Class 10 Chemistry notes pack. Total: 50 questions.

A. Important / Main Topics

1. An electrochemical cell in which electrical energy is used to drive a chemical reaction is called:

(A) Electrolytic cell
(B) Galvanic cell
(C) Voltaic cell
(D) Daniel cell

Correct Answer: A

Explanation: An electrolytic cell uses electrical energy to drive a chemical reaction.

2. In an electrolytic cell, oxidation occurs at the:

(A) Cathode
(B) Anode
(C) Salt bridge
(D) Voltmeter

Correct Answer: B

Explanation: In an electrolytic cell, oxidation occurs at the Anode.

3. Which of the following is an example of an electrolyte?

(A) Urea
(B) Glucose
(C) NaCl
(D) Sucrose

Correct Answer: C

Explanation: NaCl is an electrolyte; it conducts electricity in molten or aqueous state.

4. During the electrolysis of molten sodium chloride, the product at the cathode is:

(A) Chlorine gas
(B) Hydrogen gas
(C) Oxygen gas
(D) Sodium metal

Correct Answer: D

Explanation: During the electrolysis of molten NaCl, sodium metal is produced at the cathode.

5. In a galvanic cell, electrons flow from:

(A) Anode to cathode
(B) Cathode to anode
(C) Salt bridge to electrodes
(D) Voltmeter to electrodes

Correct Answer: A

Explanation: Electrons flow from anode to cathode in a galvanic cell.

6. The tendency of a metal to become oxidized or reduced when placed in its salt solution is called:

(A) Activation energy
(B) Electrode potential
(C) Ionization energy
(D) Lattice energy

Correct Answer: B

Explanation: Electrode potential is the tendency of a metal to become oxidized or reduced.

7. During the electrolysis of concentrated aqueous NaCl, the product at the anode is:

(A) Hydrogen gas
(B) Oxygen gas
(C) Chlorine gas
(D) Sodium metal

Correct Answer: C

Explanation: During the electrolysis of concentrated aqueous NaCl, chlorine gas is produced at the anode.

8. Electroplating is used to:

(A) Dissolve a metal in a solution
(B) Produce electricity from a chemical reaction
(C) Separate two metals from an alloy
(D) Deposit one metal on another metal

Correct Answer: D

Explanation: Electroplating is used to deposit one metal on another metal.

9. In a Daniel cell, the anode is made of:

(A) Zinc
(B) Copper
(C) Silver
(D) Platinum

Correct Answer: A

Explanation: In a Daniel cell, the anode is made of zinc.

10. A fuel cell is a special type of galvanic cell which is based upon the reaction between oxygen and:

(A) Nitrogen
(B) Hydrogen
(C) Chlorine
(D) Carbon

Correct Answer: B

Explanation: A fuel cell is based on the reaction between oxygen and hydrogen.

11. In the electrolysis of dilute aqueous NaCl, the product at the anode is:

(A) Chlorine gas
(B) Hydrogen gas
(C) Oxygen gas
(D) Sodium metal

Correct Answer: C

Explanation: In dilute aqueous NaCl, OH^- ions are discharged instead of Cl^- ions, producing oxygen gas at the anode.

12. During the electrolysis of dilute sulphuric acid using platinum electrodes, the product at the cathode is:

(A) Oxygen gas
(B) Sulphur dioxide
(C) Sulphur trioxide
(D) Hydrogen gas

Correct Answer: D

Explanation: In the electrolysis of dilute sulphuric acid, hydrogen gas is produced at the cathode.

13. In a voltaic cell, the salt bridge serves the function of:

(A) Maintaining electrical neutrality by allowing ion movement
(B) Preventing electrons from flowing in the external circuit
(C) Storing excess energy from the cell

(D) Generating additional voltage for the cell

Correct Answer: A

Explanation: In a voltaic cell, the salt bridge serves the function of Maintaining electrical neutrality by allowing ion movement.

14. If the voltage data shows metal A has a higher standard reduction potential than metal B, it can be concluded that:

(A) Metal A is more reactive than metal B
(B) Metal B is more reactive than metal A
(C) Metal A and metal B have the same reactivity
(D) Metal A is less likely to gain electrons than metal B

Correct Answer: B

Explanation: Metal A has a higher reduction potential, so it is less reactive than metal B.

15. In the electrolysis of copper(II) sulphate using platinum electrodes, the product at the anode is:

(A) Copper metal
(B) Hydrogen gas
(C) Oxygen gas
(D) Sulphur dioxide

Correct Answer: C

Explanation: In the electrolysis of CuSO□ using platinum electrodes, oxygen gas is produced at the anode.

16. In the electrolysis of copper(II) sulphate using copper electrodes, the reaction at the anode is:

(A) $Cu^{2}□ + 2e□ \rightarrow Cu$
(B) $2H□ + 2e□ \rightarrow H□$
(C) $4OH□ \rightarrow 2H□O + O□ + 4e□$
(D) $Cu \rightarrow Cu^{2}□ + 2e□$

Correct Answer: D

Explanation: In the electrolysis of copper(II) sulphate using copper electrodes, the reaction at the anode is $Cu \rightarrow Cu^{2}□ + 2e□$.

17. Which of the following is a disadvantage of using fuel cells?

(A) Hydrogen is highly inflammable and explosive
(B) They are highly efficient
(C) They produce no harmful pollutants
(D) They have no moving parts

Correct Answer: A

Explanation: Hydrogen is highly inflammable and explosive, which is a disadvantage of fuel cells.

18. Electroplating of steel with zinc is done to:

(A) Make it more shiny
(B) Protect it from corrosion
(C) Make it softer
(D) Increase its density

Correct Answer: B

Explanation: Zinc plating on steel is done to protect it from corrosion.

19. In the electrolysis of concentrated aqueous NaCl, sodium ions are not reduced to sodium metal because:

(A) Sodium is less reactive than hydrogen
(B) Sodium ions are not attracted to the cathode
(C) Sodium is more reactive than hydrogen
(D) Sodium ions are too large to be reduced

Correct Answer: C

Explanation: Sodium is more reactive than hydrogen, so hydrogen ions are reduced instead of sodium ions.

20. The reducing agent in a hydrogen-oxygen fuel cell is:

(A) Oxygen
(B) Water
(C) KOH
(D) Hydrogen

Correct Answer: D

Explanation: Hydrogen is the reducing agent in a hydrogen-oxygen fuel cell.

21. In the electrolysis of copper(II) sulphate using copper electrodes, the concentration of the solution:

(A) Remains constant
(B) Increases
(C) Decreases
(D) Becomes zero

Correct Answer: A

Explanation: In the electrolysis of copper(II) sulphate using copper electrodes, the concentration of the solution Remains constant.

22. Which of the following is NOT an advantage of hydrogen-oxygen fuel cells?

(A) They are highly efficient
(B) Hydrogen is highly inflammable and explosive
(C) They produce no harmful pollutants
(D) They have no moving parts

Correct Answer: B

Explanation: Hydrogen being highly inflammable and explosive is a disadvantage of fuel cells, not an advantage.

23. In the electrolysis of molten lead(II) chloride, the product at the cathode is:

(A) Chlorine gas
(B) Hydrogen gas
(C) Lead metal
(D) Oxygen gas

Correct Answer: C

Explanation: In the electrolysis of molten PbCl□, lead metal is produced at the cathode.

24. The standard hydrogen electrode is used to:

(A) Generate electricity
(B) Store hydrogen gas
(C) Produce chlorine gas
(D) Measure electrode potentials

Correct Answer: D

Explanation: The standard hydrogen electrode is used to measure electrode potentials.

25. In the electrolysis of concentrated aqueous NaCl, the solution becomes:

(A) Sodium hydroxide
(B) Sodium chloride
(C) Hydrochloric acid
(D) Sulphuric acid

Correct Answer: A

Explanation: In the electrolysis of concentrated aqueous NaCl, the solution becomes Sodium hydroxide.

B. Less Important / Secondary Topics

26. Electroplating of chromium on steel requires pre-plating with:

(A) Copper or nickel
(B) Zinc or tin
(C) Silver or gold

(D) Lead or mercury

Correct Answer: A

Explanation: Chromium plating on steel requires pre-plating with copper or nickel.

27. In a hydrogen-oxygen fuel cell, the product at the anode is:

(A) Oxygen gas
(B) Water
(C) Hydrogen gas
(D) Hydroxide ions

Correct Answer: B

Explanation: In a hydrogen-oxygen fuel cell, water is produced at the anode.

28. In the electrolysis of dilute aqueous NaCl, OH^- ions are discharged instead of Cl^- ions because of:

(A) The colour of the solution
(B) The temperature of the solution
(C) The concentration effect and overpotential of chlorine gas
(D) The type of electrode used

Correct Answer: C

Explanation: In dilute aqueous NaCl, OH^- ions are discharged instead of Cl^- ions due to the concentration effect and the overpotential of chlorine gas.

29. Which of the following statements about a fuel cell is INCORRECT?

(A) It is a special type of galvanic cell
(B) It produces water as the only chemical product
(C) It has no moving parts
(D) It produces harmful pollutants

Correct Answer: D

Explanation: It produces harmful pollutants — this correctly answers the question.

30. In a galvanic cell, the electrode with the lower reduction potential acts as the:

(A) Anode
(B) Cathode
(C) Salt bridge
(D) Voltmeter

Correct Answer: A

Explanation: In a galvanic cell, the electrode with the lower reduction potential acts as the anode.

31. During the electrolysis of copper(II) sulphate using copper electrodes, the concentration of the solution:

(A) Increases
(B) Remains constant
(C) Decreases
(D) Becomes zero

Correct Answer: B

Explanation: During the electrolysis of copper(II) sulphate using copper electrodes, the concentration of the solution Remains constant.

32. Which of the following is NOT an advantage of hydrogen-oxygen fuel cells?

(A) They are highly efficient
(B) They produce no harmful pollutants
(C) Hydrogen is highly inflammable and explosive
(D) They have no moving parts

Correct Answer: C

Explanation: Hydrogen being highly inflammable and explosive is a disadvantage of fuel cells, not an advantage.

33. In the electrolysis of molten lead(II) chloride, the product at the cathode is:

(A) Chlorine gas
(B) Hydrogen gas
(C) Oxygen gas
(D) Lead metal

Correct Answer: D

Explanation: In the electrolysis of molten PbCl□, lead metal is produced at the cathode.

34. The standard hydrogen electrode is used to:

(A) Measure electrode potentials
(B) Generate electricity
(C) Store hydrogen gas
(D) Produce chlorine gas

Correct Answer: A

Explanation: The standard hydrogen electrode is used to measure electrode potentials.

35. In the electrolysis of concentrated aqueous NaCl, the solution becomes:

(A) Sodium chloride
(B) Sodium hydroxide
(C) Hydrochloric acid
(D) Sulphuric acid

Correct Answer: B

Explanation: In the electrolysis of concentrated aqueous NaCl, the solution becomes Sodium hydroxide.

36. In the electrolysis of dilute aqueous NaCl, OH□ ions are discharged instead of Cl□ ions because of:

(A) The colour of the solution
(B) The temperature of the solution
(C) The concentration effect and overpotential of chlorine gas
(D) The type of electrode used

Correct Answer: C

Explanation: In dilute aqueous NaCl, OH□ ions are discharged instead of Cl□ ions due to the concentration effect and the overpotential of chlorine gas.

37. Which of the following statements about a fuel cell is INCORRECT?

(A) It is a special type of galvanic cell
(B) It produces water as the only chemical product
(C) It has no moving parts
(D) It produces harmful pollutants

Correct Answer: D

Explanation: It produces harmful pollutants — this correctly answers the question.

38. In a galvanic cell, the electrode with the lower reduction potential acts as the:

(A) Anode
(B) Cathode
(C) Salt bridge
(D) Voltmeter

Correct Answer: A

Explanation: In a galvanic cell, the electrode with the lower reduction potential acts as the anode.

39. In the electrolysis of copper(II) sulphate using copper electrodes, the reaction at the anode is:

(A) $Cu^{2}\square + 2e\square \rightarrow Cu$
(B) $Cu \rightarrow Cu^{2}\square + 2e\square$
(C) $2H\square + 2e\square \rightarrow H\square$
(D) $4OH\square \rightarrow 2H\square O + O\square + 4e\square$

Correct Answer: B

Explanation: In the electrolysis of copper(II) sulphate using copper electrodes, the reaction at the anode is Cu → Cu²□ + 2e□.

40. In a hydrogen-oxygen fuel cell, the product at the anode is:

(A) Oxygen gas
(B) Hydrogen gas
(C) Water
(D) Hydroxide ions

Correct Answer: C

Explanation: In a hydrogen-oxygen fuel cell, water is produced at the anode.

41. In the electrolysis of dilute aqueous NaCl, the product at the anode is:

(A) Chlorine gas
(B) Hydrogen gas
(C) Sodium metal
(D) Oxygen gas

Correct Answer: D

Explanation: In dilute aqueous NaCl, OH□ ions are discharged instead of Cl□ ions, producing oxygen gas at the anode.

42. During the electrolysis of dilute sulphuric acid using platinum electrodes, the product at the cathode is:

(A) Hydrogen gas
(B) Oxygen gas
(C) Sulphur dioxide
(D) Sulphur trioxide

Correct Answer: A

Explanation: In the electrolysis of dilute sulphuric acid, hydrogen gas is produced at the cathode.

43. In a voltaic cell, the salt bridge serves the function of:

(A) Preventing electrons from flowing in the external circuit
(B) Maintaining electrical neutrality by allowing ion movement
(C) Storing excess energy from the cell
(D) Generating additional voltage for the cell

Correct Answer: B

Explanation: In a voltaic cell, the salt bridge serves the function of Maintaining electrical neutrality by allowing ion movement.

44. If the voltage data shows metal A has a higher standard reduction potential than metal B, it can be concluded that:

(A) Metal A is more reactive than metal B
(B) Metal A and metal B have the same reactivity
(C) Metal B is more reactive than metal A
(D) Metal A is less likely to gain electrons than metal B

Correct Answer: C

Explanation: Metal A has a higher reduction potential, so it is less reactive than metal B.

45. In the electrolysis of copper(II) sulphate using platinum electrodes, the product at the anode is:

(A) Copper metal
(B) Hydrogen gas
(C) Sulphur dioxide
(D) Oxygen gas

Correct Answer: D

Explanation: In the electrolysis of CuSO□ using platinum electrodes, oxygen gas is produced at the anode.

46. Which of the following is NOT an advantage of hydrogen-oxygen fuel cells?

(A) Hydrogen is highly inflammable and explosive
(B) They are highly efficient
(C) They produce no harmful pollutants
(D) They have no moving parts

Correct Answer: A

Explanation: Hydrogen being highly inflammable and explosive is a disadvantage of fuel cells, not an advantage.

47. In the electrolysis of molten lead(II) chloride, the product at the cathode is:

(A) Chlorine gas
(B) Lead metal
(C) Hydrogen gas
(D) Oxygen gas

Correct Answer: B

Explanation: In the electrolysis of molten PbCl□, lead metal is produced at the cathode.

48. The standard hydrogen electrode is used to:

(A) Generate electricity
(B) Store hydrogen gas
(C) Measure electrode potentials
(D) Produce chlorine gas

Correct Answer: C

Explanation: The standard hydrogen electrode is used to measure electrode potentials.

49. In the electrolysis of concentrated aqueous NaCl, the solution becomes:

(A) Sodium chloride
(B) Hydrochloric acid
(C) Sulphuric acid
(D) Sodium hydroxide

Correct Answer: D

Explanation: In the electrolysis of concentrated aqueous NaCl, the solution becomes Sodium hydroxide.

50. Electroplating of chromium on steel requires pre-plating with:

(A) Copper or nickel
(B) Zinc or tin
(C) Silver or gold
(D) Lead or mercury

Correct Answer: A

Explanation: Chromium plating on steel requires pre-plating with copper or nickel.