

Chem.11-Q3W5-Electrochemistry-H.W

Matching

Match each item with the correct statement below.

- | | |
|-----------------------|-------------------------|
| a. anion | f. electrolysis |
| b. anode | g. electrolytic cell |
| c. cathode | h. galvanic cell |
| d. cation | i. potential difference |
| e. electrical current | j. voltage |

- ____ 1. In a(n) _____, electrical energy is used to bring about chemical changes.
- ____ 2. A process in which electrical energy is used to decompose a compound into its elements is called _____.
- ____ 3. In an electrochemical cell, electrons travel from the _____, a region of high negative potential.
- ____ 4. The difference in electrical potential is called _____.
- ____ 5. An ion with a positive charge is called a(n) _____.
- ____ 6. The flow of electrons through a system is called a(n) _____.
- ____ 7. An ion with a negative charge is called a(n) _____.
- ____ 8. If there is no _____ between electrodes, electric current will not flow.
- ____ 9. _____ is a region of low negative potential.
- ____ 10. A system designed to produce electricity from chemical changes is known as a(n) _____.

Match each item with the correct item below.

- | | |
|--------------|--------------|
| a. oxidation | b. reduction |
|--------------|--------------|

- ____ 11. $\text{Ag}^+ + e^- \rightarrow \text{Ag}$
- ____ 12. $\text{Zn} \rightarrow \text{Zn}^{2+} + 2e^-$
- ____ 13. $\text{Sn}^{2+} + 2e^- \rightarrow \text{Sn}$
- ____ 14. $\text{Ni} \rightarrow \text{Ni}^{2+} + 2e^-$

True/False

Indicate whether the statement is true or false.

- ____ 15. The electrode where oxidation takes place is called the cathode of the cell.
- ____ 16. Rusting of iron is an example of reduction of iron.
- ____ 17. A storage battery such as a nickel-cadmium battery cannot be recharged.
- ____ 18. A lithium battery is used in cell phones and electric cars since lithium has the highest standard electrode potential of the metallic elements.
- ____ 19. In a zinc-carbon dry cell, the zinc cell functions as the cathode.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ____ 20. When two halves of a spontaneous redox reaction are separated and made to transfer electrons through a wire, a(n) _____ is formed.
- battery
 - anode
 - cathode
 - half-cell
- ____ 21. One of the metals most difficult to oxidize is _____.
- sodium
 - calcium
 - potassium
 - copper
- ____ 22. The properties of the _____ makes a dry cell "dry."
- anode
 - electrolyte
 - casing
 - cathode
- ____ 23. The purpose of adding cryolite (Na_3AlF_6) in the process of extracting aluminum from bauxite is to _____.
- provide an electrolyte
 - provide a source of aluminum
 - lower the melting point of bauxite
 - provide a source of fluorine
- ____ 24. In the equation, $2\text{K}^+ + 2\text{Cl}^- \rightarrow 2\text{K(l)} + \text{Cl}_2\text{(g)}$, what is the anion?
- Cl^-
 - K^+
 - Cl_2
 - K
- ____ 25. A device used to measure the flow of current in a cell is the _____.
- anode
 - voltmeter
 - cathode
 - salt bridge
- ____ 26. In the electrolysis of potassium bromide, bromine appears at the _____.
- anion
 - cation
 - anode
 - cathode
- ____ 27. Using an electrical current to break molten bauxite, Al_2O_3 , into aluminum metal and a gas is an example of _____.
- recycling
 - electrolysis
 - an anode
 - a cathode
- ____ 28. In a galvanic cell, the electrode that is more easily oxidized is the _____.
- cation
 - cathode
 - anode
 - anion
- ____ 29. In the equation, $2\text{K}^+ + 2\text{Cl}^- \rightarrow 2\text{K(l)} + \text{Cl}_2\text{(g)}$, what is produced at the anode?
- Cl^-
 - Cl_2
 - K^+
 - K
- ____ 30. A common flashlight battery is not a _____.
- carbon-zinc battery
 - lead storage battery
 - galvanic cell
 - dry cell
- ____ 31. One disadvantage of nickel-cadmium batteries that improved technology cannot overcome is the _____.
- power limitations
 - toxicity of cadmium
 - size
 - cost
- ____ 32. A strip of magnesium is placed in a silver nitrate solution, and a strip of silver is placed in a solution of magnesium chloride. In which case will a reaction take place?
- silver in magnesium chloride
 - Both will react.
 - Neither will react.
 - magnesium in silver nitrate
- ____ 33. An example of a cation is _____.
- Na
 - Cl_2
 - Na^+
 - Cl^-

- ____ 34. In the equation, $2K^+ + 2Cl^- \rightarrow 2K(l) + Cl_2(g)$, what is the cation?
a. K^+ c. K
b. Cl_2 d. Cl^-
- ____ 35. The size of an electrical current depends on _____ potential difference.
a. the direction of the c. whether there is a
b. the source of the d. the size of the
- ____ 36. Assume an object is to be plated with copper. In the electroplating process, the anode is made of _____.
a. copper c. the object itself
b. carbon d. an electrolyte
- ____ 37. Which process might be used for DNA fingerprinting in a criminal case?
a. electroplating c. electrophoresis
b. anodizing d. electrolytic cleaning
- ____ 38. In the equation, $2K^+ + 2Cl^- \rightarrow 2K(l) + Cl_2(g)$, what is oxidized?
a. Cl_2 c. Cl^-
b. K^+ d. K
- ____ 39. The part of the electrolytic cell at which electrons are produced is the _____.
a. anode c. external circuit
b. salt bridge d. cathode
- ____ 40. In electrolysis, which reaction—oxidation or reduction—occurs at a faster rate?
a. oxidation c. It depends on the reaction.
b. They occur at the same rate. d. reduction
- ____ 41. In the equation, $2K^+ + 2Cl^- \rightarrow 2K(l) + Cl_2(g)$, what is reduced?
a. K^+ c. Cl^-
b. K d. Cl_2
- ____ 42. The flow of electrons in a particular direction is called _____.
a. oxidation c. electrolysis
b. an electrical current d. reduction
- ____ 43. In the equation, $2K^+ + 2Cl^- \rightarrow 2K(l) + Cl_2(g)$, what is produced at the cathode?
a. Cl^- c. K^+
b. Cl_2 d. K
- ____ 44. One type of experimental battery for electric cars uses the active metal _____.
a. sodium c. potassium
b. lithium d. rubidium
- ____ 45. A Downs cell can be used to prepare _____.
a. sodium chloride c. chlorine gas
b. oxygen gas d. hydrogen gas
- ____ 46. Aluminum is more easily oxidized than tin. In an aluminum-tin galvanic cell, electrons flow from the _____ electrode to the _____ electrode.
a. Al^{3+} , Al c. Sn^{2+} , Sn
b. Sn, Al d. Al, Sn
- ____ 47. When a lead storage battery operates, _____ is oxidized.
a. Pb c. Pb^{4+}
b. Pb^{2+} d. H_2SO_4
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