

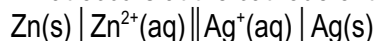
ELECTROCHEMISTRY REVIEW QUIZ

- Which indicates oxidation?
 - loss of electrons OR decrease in oxidation number
 - gain of electrons OR increase in oxidation number
 - gain of electrons OR decrease in oxidation number
 - loss of electrons OR increase in oxidation number
- Which indicates reduction?
 - loss of electrons OR decrease in oxidation number
 - gain of electrons OR increase in oxidation number
 - gain of electrons OR decrease in oxidation number
 - loss of electrons OR increase in oxidation number
- Which statement concerning the following reaction is correct?
$$3 \text{CuBr}_2(\text{aq}) + 2 \text{Al}(\text{s}) \rightarrow 3 \text{Cu}(\text{s}) + 2 \text{AlBr}_3(\text{aq})$$
 - Bromine is oxidized and copper is reduced.
 - Aluminum is oxidized and bromine is reduced.
 - Copper is oxidized and bromine is reduced.
 - Copper is oxidized and aluminum is reduced.
 - Aluminum is oxidized and copper is reduced.
- What is the oxidation number of selenium in potassium selenite, K_2SeO_3 ?
 - +6
 - +4
 - +3
 - +2
 - 0
- What is the oxidation number of carbon in benzene, C_6H_6 ?
 - +2
 - +1
 - 0
 - 1
 - 2
- Which element is reduced in the following reaction?
$$\text{Cr}_2\text{O}_7^{2-} + 14 \text{H}^+ + 6 \text{Br}^- \rightarrow 2 \text{Cr}^{3+} + 3 \text{Br}_2 + 7 \text{H}_2\text{O}$$
 - chromium
 - oxygen
 - hydrogen
 - bromine

7. Which of the following metals will react spontaneously with a solution of nickel(II) ions?
- A. copper
 - B. tin
 - C. silver
 - D. iron

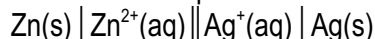
8. Which of the following will not result in a spontaneous redox reaction?
- A. Zinc is put in a solution of chromium(III) ions.
 - B. Copper is put in a solution of silver ions.
 - C. Hydrogen gas is bubbled through a solution of cobalt(II) ions.
 - D. Chlorine gas is bubbled through a solution of bromide ions.

9. What occurs at the cathode of the following galvanic cell?



- A. Silver ions are reduced.
- B. Silver metal is oxidized.
- C. Zinc metal is oxidized.
- D. Zinc ions are reduced.

10. What is the cell potential of the following galvanic cell?



- A. +1.56 V
- B. -1.56 V
- C. +0.04 V
- D. -0.04 V
- E. +0.76 V

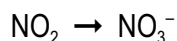
11. The function of a salt bridge in a galvanic cell is to provide . . .

- A. a circuit for the flow of electrons from one half-cell to the other.
- B. a path for the migration of ions from one half-cell to the other.
- C. a location for the oxidation half-reaction to occur.
- D. a location for the reduction half-reaction to occur.

12. Which statement concerning the anode in an operating galvanic cell is true?

- A. Reduction occurs at the anode, and cations migrate toward the anode.
- B. Reduction occurs at the anode, and anions migrate toward the anode.
- C. Oxidation occurs at the anode, and anions migrate toward the anode.
- D. Oxidation occurs at the anode, and cations migrate toward the anode.

13. Consider the following skeleton half-reaction.



Which is the correct balanced half-reaction when the reaction occurs in a basic solution?

- A. $\text{NO}_2 + \text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{NO}_3^- + 2\text{OH}^-$
- B. $\text{NO}_2 + \text{H}_2\text{O} \rightarrow \text{NO}_3^- + 2\text{H}^+ + \text{e}^-$
- C. $\text{NO}_2 + 2\text{OH}^- + \text{e}^- \rightarrow \text{NO}_3^- + \text{H}_2\text{O}$
- D. $\text{NO}_2 + \text{H}_2\text{O} + \text{e}^- \rightarrow \text{NO}_3^- + 2\text{H}^+$
- E. $\text{NO}_2 + 2\text{OH}^- \rightarrow \text{NO}_3^- + \text{H}_2\text{O} + \text{e}^-$

14. What is the typical oxidizing agent in the corrosion of iron?
- A. iron ions
 - B. oxygen and water
 - C. hydroxide ions
 - D. iron metal
 - E. oxygen alone
15. Cathodic protection of iron helps prevent corrosion by . . .
- A. isolating the iron from the environment.
 - B. keeping the iron dry.
 - C. reversing the reduction reaction.
 - D. providing an easier source of electrons for the reduction half-reaction.
 - E. producing a more corrosion-resistant alloy.
16. Which of the following metals cannot be used as a sacrificial anode to protect iron against corrosion?
- A. magnesium
 - B. zinc
 - C. chromium
 - D. nickel

ANSWERS

- 1. D
- 2. C
- 3. E
- 4. B
- 5. D
- 6. A
- 7. D
- 8. C
- 9. A
- 10. A
- 11. B
- 12. C
- 13. E
- 14. B
- 15. D
- 16. D