Chemistry
EOC Review 8: Oxidation-Reduction

1. A battery consists of which type of cells?
   a. electrolytic
   b. electrochemical
   c. electroplating
   d. electromagnetic

2. Given the reaction: ZnO + X + heat -> Zn + XO Which element, represented by X, is used industrially to reduce the ZnO to Zn?
   a. Cu
   b. C
   c. SN
   d. Pb

3. Given the lead-acid battery reaction: $Pb + PbO_2 + H_2SO_4 \overset{\text{Discharge}}{\underset{\text{Charge}}{\rightleftharpoons}} 2PbSO_4 + 2H_2O$ Which species is oxidized during battery discharge?
   a. Pb
   b. PbO_2
   c. SO_4^{2-}
   d. $2H_2O$

4. Which type of reaction is occurring when a metal undergoes corrosion?
   a. oxidation-reduction
   b. neutralization
   c. polymerization
   d. saponification

5. Which substance functions as the electrolyte in an automobile battery?
   a. PbO_2
   b. $PbSO_4$
   c. H_2SO_4
   d. H_2O

6. Given the reaction for the nickel-cadmium battery: $2NiOH + Cd + 2H_2O \rightarrow 2Ni(OH)_2 + Cd(OH)_{22}$
   What species is oxidized during the discharge of the battery?
   a. Ni^{3+}
   b. Ni^{2+}
   c.Cd
   d. Cd^{2+}

7. Given the redox reaction: $2I^-(aq) + Br_2(l) \rightarrow 2Br^-(aq) + I_{2(s)}$ What occurs during this reaction?
   a. The I^- ion is oxidized, and its oxidation number increases.
   b. The I^- ion is oxidized, and its oxidation number decreases.
   c. The I^- ion is reduced, and its oxidation number increases.
   d. The I^- ion is reduced, and its oxidation number decreases.

8. Which half-reaction correctly represents reduction?

a. $Cr^{3+} + 3e^- \rightarrow Cr(s)$

b. $Cr^{3+} + \rightarrow Cr(s) + 3e^-$

c. $Cr(s) \rightarrow Cr^{3+} + 3e^-$

d. $Cr(s) + 3e^- \rightarrow Cr^{3+}$

9. What is the oxidation number of carbon in NaHCO3?

a. +6

b. +2

c. -4

d. +4

10. Which statement correctly describes a redox reaction?

a. The oxidation half-reaction and the reduction-half reaction occur simultaneously.

b. The oxidation half-reaction occurs before the reduction half reaction

c. The oxidation half-reaction occurs after the reduction half-reaction

d. The oxidation half-reaction occurs spontaneously but the reduction half-reaction does not

11. Which quantities are conserved in all oxidation-reduction reactions?

a. charge, only

b. mass only

c. both charge and mass

d. neither charge and mass

12. Given the reaction: 2Li(s) + Cl2(g) -> 2LiCl(s) As the reaction takes place, the Cl2(g) will

a. gain electrons

b. lose electrons

c. gain protons

d. lose protons.

13. Given the balanced equation: $2Al(s) + 6H^+(aq) \rightarrow 2Al^{3+}(aq) + 3H2$ When 2 moles of Al(s) completely reacts, what is the total number of moles of electrons transferred from Al(s) to $H^+(aq)$?

a. 5

b. 6

c. 3

d. 4

14. Which statement best describes how a salt bridge maintains electrical neutrality in the half cells of an electrochemical cell?

a. It prevents the migration of electrons.

b. It permits the migration of ions.

c. It permits the two solutions to mix completely.

d. It prevents the reaction from occurring spontaneously.

15. In what kind of cell are the redox reactions made to occur by an externally applied electrical current?

a. galvanic cell

b. chemical cell

c. electrochemical cell

d. electrolytic cell

16. Which atoms forms an ion that would migrate toward the cathode in a electrolytic cell?

a. F

b. I

c. Na

d. C

17. Given the reaction: __Mg + __Cr^{3+} -> __Mg^{2+} + __Cr When the equation is correctly balanced using smallest whole numbers, the sum of the coefficients will be

a. 10

b. 7

c. 5

d. 4

18. When a substance is oxidized, it

a. loses protons

b. gains protons

c. acts as an oxidizing agent

d. acts as a reducing agent