Redox Practice (Introduction to Redox)

Part One: Multiple Choice – circle the best response

1. What is the oxidation number of C in the $C_3H_5O_2^-$ ion ?

   A. $-\frac{1}{3}$

   B. $-\frac{2}{3}$

   C. -1

   D. -2

2. When As_4 is changed to H_3AsO_4 the oxidation number of the As

   A. decreases by 5.
   B. increases by 5/4.
   C. increases by 5.
   D. increases by 20.

3. The reduced substance in a chemical reaction

   A. is the reducing agent and loses electrons.
   B. is the reducing agent and gains electrons.
   C. is the oxidizing agent and loses electrons.
   D. is the oxidizing agent and gains electrons.

4 Which of the following best describes a *reducing agent*?

A. a substance that is reduced in a reaction
B. a substance that gains electrons in a reaction
C. a substance that shows a decrease in oxidation number in a reaction
D. a substance that shows an increase in oxidation number in a reaction

5 Which of the following is an equation representing a redox reaction?

A. $2NO_{2(g)} \rightarrow N_2O_{4(g)}$
B. $Mg_{(s)} + Cl_{2(g)} \rightarrow MgCl_{2(s)}$
C. $Ag^+_{(aq)} + Cl^-_{(aq)} \rightarrow AgCl_{(s)}$
D. $NH_{3(aq)} + H^+_{(aq)} \rightarrow NH_4{}^+_{(aq)}$

6 Consider the following:

$$2NO_3^- + 4H^+ + 2e^- \rightarrow N_2O_4 + 2H_2O$$

This equation represents

A. reduction.
B. oxidation.
C. neutralization.
D. decomposition.

7 Consider the following redox equation:

$$2KMnO_4 + 5H_2SO_3 \rightarrow K_2SO_4 + 2MnSO_4 + 2H_2SO_4 + 3H_2O$$

Which species undergoes oxidation?

A. H in H_2SO_3
B. S in H_2SO_3
C. K in $KMnO_4$
D. Mn in $KMnO_4$

8. Which statement is correct for the following equation?

$$3C_3H_8O + Cr_2O_7^{2-} + 8H^+ \rightarrow 3C_3H_6O + 2Cr^{3+} + 7H_2O$$

A. Cr in $Cr_2O_7^{2-}$ gains electrons.

B. C_3H_8O acts as the oxidizing agent.

C. The equation is not a redox equation.

D. $Cr_2O_7^{2-}$ is oxidized and C_3H_8O is reduced.

9 Consider the following redox equation:

$$3C_3H_8O + K_2Cr_2O_7 + 4H_2SO_4 \rightarrow 3C_3H_6O + Cr_2(SO_4)_3 + K_2SO_4 + 7H_2O$$

Which species is the oxidizing agent?

A. C in C_3H_8O

B. H in C_3H_8O

C. O in C_3H_8O

D. Cr in $K_2Cr_2O_7$

10 Identify the substance that is oxidized in the following equation:

$$Br_2 + SO_2 + Na_2SO_4 + 2H_2O \rightarrow 2H_2SO_4 + 2NaBr$$

A. Br_2

B. SO_2

C. H_2O

D. Na_2SO_4

11 What is the reducing agent in the following equation?

$$2Fe^{3+} + 2I^- \rightarrow 2Fe^{2+} + I_2$$

A. I_2
B. I^-
C. Fe^{2+}
D. Fe^{3+}

12 Consider the following redox reaction:

$$Al + MnO_4^- + 2H_2O \rightarrow Al(OH)_4^- + MnO_2$$

The chemical species being oxidized is

A. Al
B. MnO_4^-
C. $Al(OH)_4^-$
D. MnO_2

13 Consider the following redox reaction:

$$Pt + 10H^+ + 6Cl^- + 4NO_3^- \rightarrow H_2PtCl_6 + 2N_2O_4 + 4H_2O$$

The reactant that gains electrons is

A. Pt
B. H^+
C. Cl^-
D. NO_3^-

14 Consider the following:

$$O_3 + H_2O + SO_2 \rightarrow SO_4^{2-} + O_2 + 2H^+$$

In the redox reaction above, the chemical species oxidized is

A. H^+
B. O_3
C. SO_2
D. SO_4^{2-}

15 When W_2O_5 is converted to WO_2 in a redox reaction, the W has been

A. reduced since its oxidation number has increased.
B. reduced since its oxidation number has decreased.
C. oxidized since its oxidation number has increased.
D. oxidized since its oxidation number has decreased.

16 A product of the oxidation of NO_2 is

A. NO
B. N_2O
C. NO_2^-
D. NO_3^-