



Chemistry

Name: _____

Section _____ OX AND RED AGENTS WS Date: _____

Directions (1-16): For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the 2011 Edition Reference Tables for Physical Setting/Chemistry.

- 1 A redox reaction is a reaction in which
- (1) only reduction occurs
 - (2) only oxidation occurs
 - (3) reduction and oxidation occur at the same time
 - (4) reduction occurs first, then oxidation occurs
- 2 All redox reactions involve
- (1) the gain of electrons only
 - (2) the loss of electrons only
 - (3) both the gain and the loss of electrons
 - (4) neither the gain nor the loss of electrons
- 3 Given the equation representing a reaction
- $$\text{Zn}_{(s)} + \text{Cu}^{2+}_{(aq)} \rightarrow \text{Zn}^{2+}_{(aq)} + \text{Cu}_{(s)}$$
- Which particles must be transferred from one reactant to the other reactant?
- (1) ions
 - (2) neutrons
 - (3) protons
 - (4) electrons
- 4 What occurs in the reaction below?
- $$4 \text{HCl} + \text{MnO}_2 \rightarrow \text{MnCl}_2 + 2 \text{H}_2\text{O} + \text{Cl}_2$$
- (1) manganese is reduced and its oxidation number changes from +4 to +2
 - (2) manganese is oxidized and its oxidation number changes from +4 to +2
 - (3) manganese is reduced and its oxidation number changes from +2 to +4
 - (4) manganese is oxidized and its oxidation number changes from +2 to +4
- 5 When a substance is oxidized it
- (1) loses protons
 - (2) gains protons
 - (3) acts as an oxidizing agent
 - (4) acts as a reducing agent
- 6 Given the equation representing a redox reaction
- $$\text{Co}_{(s)} + \text{PbCl}_{2(aq)} \rightarrow \text{CoCl}_{2(aq)} + \text{Pb}_{(s)}$$
- Which statement correctly describes the oxidation and reduction that occur?
- (1) $\text{Co}_{(s)}$ is oxidized and $\text{Cl}^{-}_{(aq)}$ is reduced
 - (2) $\text{Co}_{(s)}$ is oxidized and $\text{Pb}^{2+}_{(aq)}$ is reduced
 - (3) $\text{Co}_{(s)}$ is reduced and $\text{Cl}^{-}_{(aq)}$ is oxidized
 - (4) $\text{Co}_{(s)}$ is reduced and $\text{Pb}^{2+}_{(aq)}$ is oxidized
- 7 Given the equation representing a reaction
- $$\text{Zn}_{(s)} + 2 \text{HCl}_{(aq)} \rightarrow \text{ZnCl}_{2(aq)} + \text{H}_{2(g)}$$
- Which substance is oxidized?
- (1) $\text{Zn}_{(s)}$
 - (2) $\text{HCl}_{(aq)}$
 - (3) $\text{Cl}^{-}_{(aq)}$
 - (4) $\text{H}^{+}_{(aq)}$
- 8 Given the equation representing a reaction
- $$\text{MnO}_2 + 4\text{H}^{+} + 2\text{Fe}^{2+} \rightarrow \text{Mn}^{2+} + 2\text{Fe}^{3+} + 2\text{H}_2\text{O}$$
- Which species is oxidized?
- (1) H^{+}
 - (2) H_2O
 - (3) Fe^{2+}
 - (4) MnO_2
- 9 Consider the following redox reaction
- $$\text{Ni} + \text{Sn}^{4+} \rightarrow \text{Ni}^{2+} + \text{Sn}^{2+}$$
- Which species has been reduced?
- (1) Ni
 - (2) Sn^{4+}
 - (3) Ni^{2+}
 - (4) Sn^{2+}
- 10 Consider the following equation
- $$2 \text{Fe}^{3+} + \text{Sn}^{2+} \rightarrow 2 \text{Fe}^{2+} + \text{Sn}^{4+}$$
- Which species is the oxidizing agent?
- (1) Fe^{3+}
 - (2) Sn^{2+}
 - (3) Fe^{2+}
 - (4) Sn^{4+}

