

Name: _____

Chapter 18 Review

Period: ____

1. Consider the following reaction: $\text{Ba}(s) + \text{F}_2(g) \rightarrow \text{BaF}_2$
The barium atom is _____ electrons; therefore, it is _____.
 2. _____ is a gain of electrons.
 3. In the reaction $2\text{Ca}(s) + \text{O}_2(g) \rightarrow 2\text{CaO}(s)$,
a. calcium is _____. b. the oxidizing agent is _____
 4. In the reaction $2\text{Cs}(s) + \text{Cl}_2(g) \rightarrow 2\text{CsCl}(s)$, the chlorine is _____.
 5. The oxidation state of selenium in NaSeO_3 is _____.
 6. The oxidation state of fluorine in F_2 is _____.
 7. The oxidation state of sodium in NaOH is _____.
 8. The oxidation state of selenium in NaSeO_4 is _____.
 10. The oxidation state of nitrogen in NO_3^- is _____.
 12. The oxidation state of K in any compound is _____.
 13. The oxidation state of an element in its elemental state is _____.
 14. In which of the following compounds does nitrogen have the most positive oxidation state?
a. HNO_3 b. NH_4Cl c. N_2O d. NO_2 e. NaNO_2
 15. What is the oxidation state of Cl in NaClO_3 ?
 30. In the following reaction $2\text{K} + \text{CuCl}_2 \rightarrow 2\text{KCl} + \text{Cu}$
a. Copper is _____
b. Chlorine is _____
c. Potassium is _____
d. The oxidizing agent is _____
e. The reducing agent is _____
- Answer the questions that refer to the following reaction: $\text{TiCl}_4(l) + \text{O}_2(g) \rightarrow \text{TiO}_2(s) + 2\text{Cl}_2(g)$
- a. Which species is oxidized? b. Which species is reduced?
 35. Which species is the strongest reducing agent?
a. Na b. Fe c. Ag d. Ca
 37. Which species is the strongest oxidizing agent?
a. Cl_2 b. F_2 c. Br_2 d. O_2 e. N_2
 42. Which of the following reactions does *not* involve oxidation-reduction?
a. $\text{CH}_4 + 3\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{CO}_4$ c. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
b. $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ d. $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{Cl}_2 + 2\text{H}_2\text{O} + \text{MnCl}_2$

43. Which of the following are oxidation-reduction reactions?
- $\text{PCl}_3 + \text{Cl}_2 \rightarrow \text{PCl}_5$
 - $\text{Cu} + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$
 - $\text{CO}_2 + 2\text{LiOH} \rightarrow \text{Li}_2\text{CO}_3 + \text{H}_2\text{O}$
 - $\text{FeCl}_2 + 2\text{NaOH} \rightarrow \text{Fe}(\text{OH})_2 + 2 \text{NaCl}$
44. Which of the following statements is(are) true? Oxidation and reduction
- cannot occur independently of each other
 - accompany all chemical changes
 - describe the loss and gain of electron(s), respectively
 - result in a change in the oxidation states of the species involved
49. In the following reaction, which species is the reducing agent?
 $3\text{Cu} + 6\text{H}^+ + 2\text{HNO}_3 \rightarrow 3\text{Cu}^{2+} + 2\text{NO} + 4 \text{H}_2\text{O}$
61. Write the half reactions for the reaction of sodium bromide with chlorine gas to form sodium chloride and bromine. Identify the oxidizing agent and the reducing agent.
64. For the redox reaction $2\text{Fe}^{2+} + \text{Cl}_2 \rightarrow 2\text{Fe}^{3+} + 6\text{Cl}^-$, which of the following are the correct half-reactions?
- $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$
 - $\text{Cl}^- \rightarrow \text{Cl} + \text{e}^-$
 - $\text{Cl}_2 \rightarrow 2\text{Cl}^- + 2\text{e}^-$
 - $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}^-$
 - $\text{Fe}^{2+} + \text{e}^- \rightarrow \text{Fe}^{3+}$
67. Which of the following is *true* for a galvanic cell based on the following reaction?
 $\text{Zn}(\text{s}) + \text{Cu}^{2+}(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + \text{Cu}(\text{s})$
- The zinc is being reduced.
 - The zinc serves as the anode.
 - The Cu^{2+} ion is being reduced.
 - The Cu serves as the anode.

For the reaction $\text{Cu}^{2+}(\text{aq}) + \text{Ba}(\text{s}) \rightarrow \text{Cu}(\text{s}) + \text{Ba}^{2+}(\text{aq})$, Identify the following

- anode
- cathode
- reducing agent
- oxidizing agent
- reduction half reaction and standard electrode potential
- oxidation half reaction and standard electrode potential
- cell voltage