Name Date Class

Directed Reading for Content Mastery

Overview
Chemical Bonds

CHAPTER 18.3 REVIEW

Directions: *All of the statements below are false as written. In the space provided, write a term or phrase that makes the statement true when it is substituted for the underlined words.*

1. The properties of a compound are the same as the properties of the elements that it contains.
2. Superscript numbers in chemical formulas tell how many atoms of each element are found in a unit of compound.
3. All the noble gases except helium have 18 electrons in their outer energy level.
4. A(n) chemical formula is the force that holds atoms together in a compound.
5. An ion is a(n) neutral particle that has either more or fewer electrons than protons.
6. Oxidation numbers are written as subscripts.
7. A(n) covalent bond is the force of attraction between the opposite charges of the ions in an ionic compound.
8. The charge on a compound is always positive.
9. Equal sharing of electrons in covalent bonds results in polar molecules.
10. Only two identical atoms can share electrons unequally.
11. A binary compound contains five different elements.
12. An oxidation number tells how many protons an atom must gain, lose, or share to become stable.
13. The oxidation number of the copper(II) ion is 3+.
14. When writing chemical formulas, add superscripts so that the sum of the oxidation numbers equals ten.
15. A polyatomic ion never has a positive or negative charge.
16. The polyatomic ion SO_4^{2-} is called the sulfide ion.

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SECTION 3 Reinforcement

Writing Formulas and Naming Compounds

Directions: *Answer the following questions in the spaces provided. Refer to the periodic table for help.*

1. Define an oxidation number. _____

_____

2. What is the usual oxidation number of oxygen? Of hydrogen? _____

3. What is the sum of all the oxidation numbers in any compound? _____

4. Explain the difference between $CoCl_2 \cdot 6H_2O$ and anhydrous cobalt chloride.

_____

Directions: *Use the periodic table in your textbook to identify the oxidation numbers of the elements in each group.*

Group	1	2	16	17	18
Oxidation number	5.	6.	7.	8.	9.

Directions: *Write the formulas for the following compounds. Use the periodic table in your textbook for help.*

10. copper(II) sulfate _____
11. calcium chloride _____
12. iron(II) oxide _____
13. copper(I) oxide _____
14. sodium sulfide _____
15. magnesium sulfate heptahydrate _____

Directions: *Complete the following table by providing the name of the compound and the total number of atoms in each formula given.*

Formula	Name	Number of Atoms
16. NH_4OH		
17. NH_4Cl		
18. Ag_2O		
19. K_2SO_4		
20. $Ca(NO_3)_2$		
21. Na_2S		

Chapter Test B (continued)

Skill: Using Tables

Directions: *Use the following table to answer questions 2 through 6.*

Element/polyatomic ion	Symbol	Oxidation number
Potassium	K	1+
Magnesium	Mg	2+
Oxygen	O	2–
Nitrate	NO_3	1–
Sulfate	SO_4	2–
Phosphate	PO_4	3–

_____ 2. Which of the following is the correct formula for magnesium nitrate?
a. $MgNO_3$ b. Mg_2NO_3 c. $Mg(NO_3)_2$ d. $Mg_2(NO_3)_2$

_____ 3. What is the charge of phosphate in K_3PO_4?
a. 3– b. 1+ c. 5+ d. 7–

_____ 4. How many potassium atoms and how many oxygen atoms are there in a binary compound made from these two elements?
a. one potassium and two oxygen
b. two potassium and one oxygen
c. one potassium and one oxygen
d. three potassium and one oxygen

_____ 5. What is the correct name for K_2SO_4?
a. potassium sulfide
b. potassium(II) sulfate
c. potassium sulfate
d. potassium disulfide

_____ 6. What is the correct formula for magnesium oxide?
a. MgO b. MgO_2 c. Mg_2O_2 d. Mg_2O

7. What is the name of the compound with the formula CaO? _____

8. What is the name of the compound with the formula $MgCl_2$? _____

Skill: Concept Mapping

Directions: *Identify, by writing in the appropriate column in the table, which of the terms listed below could be linked in a concept map to ionic bonds and which could be linked to covalent bonds.*

ions **positive ions** **molecules**
nonpolar **negative ions** **polar**

9. Ionic bonds	10. Covalent bonds

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Section 3 Writing Formulas and Naming Compounds

Directions: *The words in each group below are related. Using all the words in the group, write a sentence that shows how the words are related.*

Example: **compound, properties, elements**

The properties of a compound differ from the properties of the elements that make up the compound.

1. hydrate, compound, water

2. oxidation number, element, electrons

3. zero, oxidation numbers, noble gases

4. oxidation number, Roman numeral, element

5. chemical formulas, neutral, compounds

6. polyatomic, covalent, charged

7. Greek prefixes, binary covalent compounds

8. charge, oxidation number, ionic compounds