

CHAPTER 7 REVIEW

Chemical Formulas and Chemical Compounds

SECTION 1

SHORT ANSWER Answer the following questions in the space provided.

- _____ In a Stock system name such as iron(III) sulfate, the Roman numeral tells us
 - _____ (a) how many atoms of Fe are in one formula unit.
 - _____ (b) how many sulfate ions can be attached to the iron atom.
 - _____ (c) the charge on each Fe ion.
 - _____ (d) the total positive charge of the formula unit.
- _____ Changing a subscript in a correctly written chemical formula
 - _____ (a) changes the number of moles represented by the formula.
 - _____ (b) changes the charges on the other ions in the compound.
 - _____ (c) changes the formula so that it no longer represents the compound it previously represented.
 - _____ (d) has no effect on the formula.
3. The explosive TNT has the molecular formula $C_7H_5(NO_2)_3$.
 - _____ a. How many elements make up this compound?
 - _____ b. How many oxygen atoms are present in one molecule of $C_7H_5(NO_2)_3$?
 - _____ c. How many atoms in total are present in one molecule of $C_7H_5(NO_2)_3$?
 - _____ d. How many atoms are present in a sample of 2.0×10^{23} molecules of $C_7H_5(NO_2)_3$?
4. How many atoms are present in each of these formula units?
 - _____ a. $Ca(HCO_3)_2$
 - _____ b. $C_{12}H_{22}O_{11}$
 - _____ c. $Fe(ClO_2)_3$
 - _____ d. $Fe(ClO_3)_2$
5. _____
 - _____ a. What is the formula for the compound dinitrogen pentoxide?
 - _____ b. What is the Stock system name for the compound FeO?
 - _____ c. What is the formula for sulfurous acid?
 - _____ d. What is the name for the acid H_3PO_4 ?

SECTION 1 *continued*

6. Some binary compounds are ionic, others are covalent. The type of bond favored partially depends on the position of the elements in the periodic table. Label each of these claims as True or False; if False, specify the nature of the error.

a. Covalently bonded binary molecular compounds are typically composed of nonmetals.

b. Binary ionic compounds are composed of metals and nonmetals, typically from opposite sides of the periodic table.

7. Refer to the text for examples of names and formulas for polyatomic ions and acids.

a. Derive a generalization for determining whether an acid name will end in the suffix *-ic* or *-ous*.

b. Derive a generalization for determining whether an acid name will begin with the prefix *hydro-* or not.

8. Fill in the blanks in the table below.

Compound name	Formula
Aluminum sulfide	
Cesium carbonate	
	PbCl ₂
	(NH ₄) ₃ PO ₄
Hydroiodic acid	

Assessment

Chemical Formulas and Chemical Compounds

Section Quiz: Chemical Names and Formulas

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ 1. An ion of bromine with a single negative charge has the symbol and the name
- Br^+ , bromide ion.
 - Br^- , bromide ion.
 - Br^+ , bromium ion.
 - Br^- , bromium ion.
- _____ 2. The platinum(II) ion and the platinum(IV) ion
- are anions.
 - are polyatomic ions.
 - have charges of 2+ and 4+, respectively.
 - have charges of 1+ and 3+, respectively.
- _____ 3. What is the name of the compound made of zinc ions, Zn^{2+} , and fluoride ions, F^- ?
- zinc difluoride
 - zinc fluorate
 - zinc fluoride
 - zinc(II) fluorite
- _____ 4. What is the chemical formula for the compound made of tin(IV) ions and chloride, Cl^- , ions?
- SnCl_4
 - Sn_2Cl_2
 - SnCl_2
 - Sn_4Cl
- _____ 5. What is the formula for the compound made of aluminum ions, Al^{3+} , and sulfate ions, SO_4^{2-} ?
- AlSO_4
 - Al_3SO_4
 - $\text{Al}(\text{SO}_4)_3$
 - $\text{Al}_2(\text{SO}_4)_3$

Section Quiz, *continued*

- _____ 6. How many atoms are present in one formula unit of barium acetate, Ba (C₂H₃O₂)₂?
- 4
 - 8
 - 15
 - 16
- _____ 7. What is the formula for the compound dinitrogen tetroxide?
- N₂O₃
 - N₂O₄
 - N₃O₂
 - N₃O₄
- _____ 8. The term acid usually refers to
- a solution of the acid compound in water.
 - only the acid compound.
 - a compound containing hydrogen.
 - a compound containing hydrogen and oxygen.
- _____ 9. What is the formula for carbonic acid?
- CH₃COOH
 - HClO₃
 - CH₄
 - H₂CO₃
- _____ 10. The salt calcium nitrate, Ca(NO₃)₂, contains the anion from
- calcium.
 - nitrogen.
 - nitric acid.
 - nitrous acid.