

Name: \_\_\_\_\_

Homework was checked against the key with wrong answers corrected.

Parent Signature: \_\_\_\_\_

## Chapter 6: Chemical Names and Formulas

Each numbered question is worth 1 point except as noted. Total possible = 40 points

### Section 6.1

1. Provide the name and symbol of the ion formed when
  - a. a sulfur atom gains two electrons.
  - b. an aluminum atom loses three electrons.
  - c. a calcium ion loses two electrons.
2. How many electrons are lost or gained in forming each ion?
  - a.  $\text{Ba}^{2+}$
  - b.  $\text{As}^{3-}$
  - c.  $\text{Cu}^{2+}$
3. List three characteristics that distinguish ionic compounds from molecular compounds.
4. What is a cation? What is an anion? Relate the two definitions to metals and nonmetals.
5. What does the presence of an *-ide* suffix on the name of an ion tell you about that ion?
6. What are the only elements that exist in nature as isolated atoms? What term is used to describe such elements?

7. What is a molecule? What is the difference between a diatomic molecule and a triatomic molecule? Provide an example of each.

8. Write the symbol and name for the cation formed when (0.5)

a. a potassium atom loses one electron.

b. a zinc atom loses two electrons.

9. Write the symbol and name for the anion formed when (0.5)

a. a fluorine atom gains one electron.

b. a sulfur atom gains two electrons.

## Section 6.2

10. Lead forms two compounds with oxygen. One compound contains 2.98 g of lead combined with 0.461 g of oxygen. The other compound contains 9.89 g of lead combined with 0.763 g of oxygen. What is the lowest whole-number mass ratio of lead in the two compounds that combines with a given mass of oxygen?

11. In the compound nitrous oxide, also known as laughing gas and used as an anesthetic in dentistry, the mass ratio of nitrogen to oxygen is 7:4. A 68-g sample of a compound composed of nitrogen and oxygen contains 42 g of nitrogen. Is the sample nitrous oxide? Explain.

12. Differentiate between a *chemical formula*, a *molecular formula*, and a *formula unit*.



- d. bromine
- e. beryllium
- f. sodium

23. Write the formula (including charge) for each ion.

- a. ammonium ion
- b. tin(II) ion
- c. chromate
- d. nitrate ion
- e. cyanide ion
- f. iron(III) ion
- g. permanganate ion
- h. manganese(II) ion

#### Section 6.4

24. Write formulas for compounds formed from these pairs of ions.

- a.  $\text{Ba}^{2+}$ ,  $\text{S}^{2-}$
- b.  $\text{Li}^+$ ,  $\text{O}^{2-}$
- c.  $\text{Ca}^{2+}$ ,  $\text{N}^{3-}$
- d.  $\text{Cu}^{2+}$ ,  $\text{I}^-$

25. Write formulas for these compounds.

- a. sodium iodide
- b. stannous chloride
- c. potassium sulfide
- d. calcium iodide

26. Write names for these binary ionic compounds. [Note: Although silver (Ag), cadmium (Cd), and zinc (Zn) are transition metals, they do not need Roman numerals next to their names, because their charges do not vary.]

- a. ZnS
- b. KCl
- c. BaO
- d.  $\text{CuBr}_2$

27. Write names for these binary ionic compounds.

- a. CaO
- b. Cu<sub>2</sub>Se
- c. FeS
- d. AlF<sub>3</sub>

28. Write formulas for compounds formed from these pairs of ions.

- a. NH<sub>4</sub><sup>+</sup>, SO<sub>3</sub><sup>2-</sup>
- b. calcium ion, phosphate ion
- c. Al<sup>3+</sup>, NO<sub>3</sub><sup>-</sup>
- d. potassium ion, chromate ion

31. Write names for these compounds.

- a. Al(OH)<sub>3</sub>
- b. NaClO<sub>3</sub>
- c. Sn<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>
- d. Na<sub>2</sub>CrO<sub>4</sub>

34. Write the name or formula, as appropriate.

- a. chromium(III) nitrate
- b. Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>
- c. LiF
- d. sodium perchlorate
- e. Pb(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub>

### Section 6.5

37. Name these binary molecular compounds.

- a. OF<sub>2</sub>
- b. Cl<sub>2</sub>O<sub>8</sub>
- c. SO<sub>3</sub>

38. Write formulas for the following binary molecular compounds.

- a. nitrogen trifluoride
- b. disulfur dichloride
- c. dinitrogen tetroxide

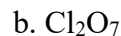
40. Give the name or formula for these common acids. (0.5)



c. nitric acid

d. phosphoric acid

41. Write the formula or name for these compounds.



c. carbon tetrabromide

d. diphosphorus trioxide

42. What element typically appears in the formula of a common acid? (0.25)

### Section 6.6

44. Write formulas for these compounds, using Figure 6.23 as an aid if necessary.

a. tin(II) hydroxide

b. barium fluoride

c. tetraiodine nonoxide

d. skip

e. calcium sulfide

### Chapter 6 Review

49. Would you expect the following pairs of atoms to combine chemically to give an ionic or molecular compound? 6.2

a. Li and S

b. O and S

c. Al and O

d. F and Cl

e. I and K

f. H and N

52. The melting point of a compound is  $1240^\circ\text{C}$ . Is this compound an ionic or a molecular compound? Explain. 6.2 (0.25)

53. Write the symbol for each ion. Be sure to include the charge. 6.3

a. oxide ion

b. lead(II) ion

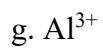
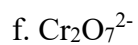
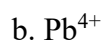
c. lithium ion

d. nitride ion

e. cupric ion

f. fluoride ion

56. Name the following ions. 6.3



62. Complete the table below by writing correct formulas for the compounds formed by combining positive and negative ions. Then name each compound. 6.4 (4)

	$\text{NO}_3^-$	$\text{CO}_3^{2-}$	$\text{CN}^-$	$\text{PO}_4^{3-}$
$\text{NH}_4^+$				
$\text{Sn}^{4+}$				
$\text{Fe}^{3+}$				
$\text{Mg}^{2+}$				

67. Name these compounds. (2)

