Name Date Class

SECTION 1 Reinforcement

Stability in Bonding

CHAPTER 18.1 REVIEW

Directions: *Each statement below contains a pair of terms or phrases in parentheses. Circle the term or phrase that makes each statement true.*

1. The properties of a compound are (the same as, different from) the properties of the elements that make up the compound.
2. Na and Cl are chemical (symbols, formulas).
3. NaCl and NaOH are chemical (symbols, formulas).
4. In the formula H_2O, the number 2 is a (subscript, superscript).
5. The number 2 in the formula H_2O tells you that each unit of this compound contains two (hydrogen, oxygen) atoms.
6. If a symbol in a chemical formula does not have a subscript after it, a unit of that compound contains (no atoms, one atom) of that element.
7. The total number of atoms in Fe_2O_3 is (two, five, six).
8. There are (three, seven, ten) different elements in H_2SO_4.
9. An atom is chemically stable if its outer energy level (is filled with, contains no) electrons.
10. For atoms of most noble gases and most other elements, the outer energy level is full when it has (three, eight) electrons.
11. The noble gases do not readily form compounds because they (are, are not) chemically stable.
12. A chemical bond is a (force, chemical) that holds atoms together in a compound.
13. Chemical bonds form when atoms lose, gain, or (share, multiply) electrons.

Directions: *Complete the table below by using the formula of each compound to identify the elements that each compound contains and the number of atoms of each of these elements in a unit of the compound. The first formula has been done for you.*

Formula	Element 1	Element 2	Element 3
H_2O	2 hydrogen	1 oxygen	
14. NaOH			
15. NaCl			
16. NH_3			
17. H_2SO_4			
18. SiO_2			

Name Date Class

SECTION 1 Enrichment

Electron Dot Diagrams

The electrons in an atom's outer energy level are the electrons that are important to consider in chemical bonds and chemical reactions. These electrons can be represented in a diagram called an electron dot diagram. The outermost electrons are drawn as dots around the chemical symbol.

In this activity, you will draw electron dot diagrams for several elements.

Procedure

1. Write the symbol for the element. For electron dot diagrams, this symbol represents the nucleus and all of the electrons of the atom except the outermost electrons.

Example: The symbol for chlorine is Cl. In an electron dot diagram, this symbol represents the nucleus and the ten electrons in the first two energy levels.

2. Use the periodic table to determine how many outer electrons the element has. Do this by finding to which group the element belongs.

Example: Chlorine belongs to Group 17, the halogens, which have seven outer electrons.

3. Draw a dot to represent each electron in the outer level of the element. Two electrons can be placed on each side of the symbol. The first two electrons should be paired on the right side of the symbol. The rest of the outer electrons should be distributed counterclockwise one by one around the other sides of the symbol.

Example: The electron dot diagram for chlorine is

Conclude and Apply

1. Write electron dot diagrams for the elements listed.

a. hydrogen

b. neon

c. sodium

d. calcium

e. aluminum

f. fluorine

g. argon

h. potassium

2. Why do sodium and potassium have the same number of dots in their electron dot diagrams? What does this tell you about the chemistry of these two elements?

SCIENCE 9 FILMSTRIP
STUDY GUIDE: COMPOUNDS: A SPECIAL COMBINATION

TRUE AND FALSE: CORRECT THE FALSE STATEMENTS.

1..... A compound cannot be broken down into simpler substances by ordinary means.

2..... In nature it is common to find pure elements.

3..... Table salt (sodium chloride) has properties very similar to the elements, sodium and chlorine.

4..... To represent the name of chemical compound, you can write a symbol.

5..... The formula, NH_3, tells you that there are 3 nitrogen and 3 hydrogen atoms.

6..... The formula, H_2O, represents one molecule of water.

7..... The smallest part of the compound, carbon dioxide, that can exist is a molecule of carbon dioxide.

8..... Rust is a compound which contains 2 iron atoms and 3 oxygen atoms. Its formula is Fe_3O_2.

9..... It is possible for an element to have a chemical formula and a chemical symbol.

10..... The properties of carbon dioxide, CO_2, are the same as the properties of carbon monoxide, CO.

COMPLETION:

1. Suppose you heat two different substances to determine whether it is an element or compound. One of them breaks down into two new materials while the other doesn't change. The first one is a(n) .?. while the second is a(n) .?. ....

2. If you heat mercuric oxide, you will get .?. and .?. ....

3. Every sample of nitrogen oxide, NO_2 contains .?. nitrogen for every 2 oxygen atoms. .....

4. A chemical formula tells you which .?. are present in a compound. .....

5. In the formula, NH_3, the 3 is known as a .?. .....

6. When looking at a ball and stick model of a compound, the balls represent .?. .....

7. H_2O represents one .?. of water. .....

Questions 8-15 may require you to use a Periodic Table of Elements.

Formula	Number of atoms	Formula	Number of atoms
8. C_3H_8	.....	9.....	2 Nitrogen + 1 oxygen
10. CO_2	.....	11. P_4O_{10}	.....
12.....	6 carbon, 12 hydrogen, 6 oxygen		
13.....	2 hydrogen, 1 sulfur, 4 oxygen		
14. $HClO_4$	.....	15.....	1 potassium, 1 manganese, 4 oxygen

THOUGHT QUESTIONS:

1. Distinguish between elements and compounds

2. Suppose you were in the lab and given 2 different substances? What kind of experiment could you do to see which is an element and which is a compound?

3. The chemical formula for the compound, calcium oxalate, is CaC_2O_4. What does this tell you about calcium oxalate molecules?

4. Why do you think every sample of the compound, water, always contains 2 hydrogen atoms for every 1 oxygen atom?