Name _____ Date _____ Class _____

Note-taking Worksheet

Chemical Bonds

Section 1 Stability in Bonding

A. Some elements combine chemically and no longer have the same _____ they did before forming a compound.

B. A(n) _____ is composed of symbols and subscripts indicating the number of atoms of an element in a compound.

C. Atoms form compounds when the compound is more _____ than the separate atoms.

1. Noble gases are more _____ than other elements because they have a complete outer energy level.
2. Elements that do not have full outer energy levels are more stable in _____.
3. Atoms can lose, gain, or _____ electrons to get a stable outer energy level.
4. A(n) _____ is the force that holds atoms together in a compound.

Section 2 Types of Bonds

A. A(n) _____ is a charged particle because it has more or fewer electrons than protons.

1. When an atom _____ an electron, it becomes a positively charged ion; a superscript indicates the charge.
2. When an atom _____ an electron, it becomes a negatively charged ion.

B. An ionic compound is held together by the _____—the force of attraction between opposite charges of the ions.

1. The result of this bond is a(n) _____ compound.
2. The sum of the charges on the ions in a unit of the compound is _____.

C. _____ are neutral particles formed as a result of sharing electrons.

1. A _____ is the force of attraction between atoms sharing electrons.
2. Atoms can form double or triple _____ depending on whether they share two or three pairs of electrons.
3. Electrons shared in a molecule are held _____ to the atoms with the larger nucleus.

Meeting Individual Needs

Note-taking Worksheet (continued)

4. A(n) _____ **molecule** has one end that is slightly negative and one end that is slightly positive although the overall molecule is neutral.
5. In a(n) _____ **molecule,** electrons are shared equally.

Section 3 Writing Formulas and Naming Compounds

A. Chemists use _____ from the periodic table to write formulas for compounds.

B. _____—composed of two elements

1. _____—how many electrons an atom has gained, lost, or shared to become stable
2. Use oxidation numbers and their least common multiples to write _____.
   a. When writing formulas, remember that the compound is _____.
   b. A formula must have the correct number of positive and negative ions so the charges _____.
3. Use the name of the first element, the root name of the second element, and the suffix *–ide* to write the _____ of a binary ionic compound.

C. _____—positively or negatively charged, covalently bonded group of atoms

1. The compound contains _____ or more elements.
2. To write names, write the name of the _____ ion first; then write the name of the _____ ion.
3. To write _____, use the oxidation numbers, their least common multiple, and put parentheses around the polyatomic ion before adding a subscript.

D. _____—compound with water chemically attached to its ions

E. Name binary covalent compounds by using _____ to indicate how many atoms of each element are in the compound.

Name _____ Date _____ Class _____

Note-taking Worksheet

Chemical Reactions

Section 1 Chemical Changes

A. Describing _____—change of one or more substances converted into new substances

1. _____ are substances that combine or change.
2. New substances that are produced are called _____.

B. _____—a law which states that, in a chemical reaction, matter is not created or destroyed; it stays the same.

1. _____—experimented with mercury (II) oxide and heat
2. Found mass of products (liquid mercury and oxygen gas) _____ mass of reactants

C. Writing equations—a _____ uses chemical formulas and symbols to describe a chemical reaction and the product(s) it produces.

1. Chemical formula expresses the relationship between elements in the compounds and molecules they make up
2. _____—numbers which represent the number of units of each substance in a reaction
3. Knowing coefficients of chemical reactions allows chemists to use the _____ of reactants to predict the amounts of products.
4. Subscripts—numbers which represent the number of _____ in a molecule of a particular element.
5. Symbols used to show state of reactants: (*s*)_____, (*aq*)_____, (*g*)_____, (*clear*)_____.

D. _____ react with atmosphere in different ways.

Section 2 Chemical Equations

A. Checking for _____—law of conservation of mass requirement

1. A _____ **chemical reaction**—both sides of equation have same number of atoms of each element
2. Choosing coefficients— becomes easier with practice; trial and error at first

Meeting Individual Needs

Note-taking Worksheet (continued)

B. _____ balanced chemical equations—a four-step process

1. Describe the reaction in _____.
2. Write the _____ using formulas and symbols.
3. Check for _____.
4. Add _____ where needed for balance.

Section 3 Classifying Chemical Reactions

A. _____ **reaction**—two or more substance form a new substance; $A + B \rightarrow C$

B. One substance breaks down into two or more substances in a _____ **reaction**; $AB \rightarrow A + B$

C. _____ **reaction**—one element replaces another one in a compound; $A + BC \rightarrow AC + B$ or $D + BC \rightarrow BD + C$

D. A _____ **reaction** results if a **precipitate**, water, or a gas forms when two ionic compounds in solution are combined; $AB + CD \rightarrow AD + CB$

Section 4 Chemical Reactions and Energy

A. Chemical reactions involve energy _____.

1. Breaking chemical bonds _____ energy.
2. _____ chemical bonds releases energy.

B. More energy _____

1. _____—energy required to break bonds is less than the energy released from new bonds; energy given off is usually light.
2. _____ **reactions**—energy given off in the form of heat

C. More energy _____

1. _____ **reactions**—more energy is required to break bonds than to form new ones; need energy for the reaction to occur
2. If energy needed is heat, the reaction is _____.
3. A _____ speeds up a chemical reaction without itself being permanently changed.
4. An _____ prevents or slows a chemical reaction or interferes with a catalyst's action.