

Note-taking Worksheet Chapter 21

Section 1 Chemical Changes

- A. A _____ --change of one or more substances into new substances.
- _____ are substances that combine or change.
 - New substances that are produced are called _____
- B. _____ --a law which states that in a chemical reaction, matter is not created or destroyed.
- _____ experimented with mercury (II) oxide and heat.
 - 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 products it produces.
- _____ expresses the relationship between elements in the compounds and molecules they make up.
 - _____ --numbers which represent the number of units of each substance in a reaction.
 - Knowing coefficients of chemical reactions allow chemists to use the _____ of reactants to predict the amount of products.
 - _____—numbers which represent the number of _____ in a molecule of a particular element.
 - Symbols used to show state of reactants: (s) _____, (aq) _____, (g) _____, (l) _____.
- D. _____ react with atmosphere in different ways. Rust is _____ reacting with _____ to form _____.

Section 2 Chemical Equations

- A. Checking for _____ --law of conservation of mass requirement.
- A _____ chemical reaction—both sides of equation have same number of atoms of each element.

- _____—becomes easier with practice; trial and error at first.
- B. _____ balanced chemical equations—a four-step process.
- Describe the reaction in _____.
 - Write the _____ using formulas and symbols.
 - Check for _____.
 - Add _____ where needed for balance.

Section 3 Classifying Chemical Reactions

- A. _____ reaction—two or more substances 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 _____.
- Breaking chemical bonds _____ energy.
 - Forming chemical bonds _____ energy.
- B. More energy _____.
- _____ - energy required to break bonds is less than energy released from new bonds; energy given off is usually light.
 - _____ reactions—energy given off in form of heat.
- C. More energy _____.
- _____ reactions—more energy is required to break bonds than to form new ones; need energy for the reaction to occur.
 - If energy needed is heat, the reaction is _____.
 - A _____ speeds up a chemical reaction without itself being permanently changed.
 - An _____ prevents or slows a chemical reaction or interferes with a catalyst's action.
 - _____ is the heat needed to raise _____ g of H_2O by $1^\circ C$.
 - The _____ is another label for energy used in chemistry. $4.184 J =$ _____.