

Chemistry Chapter 4

Balancing chemical Equations

Chemical Reactions

- Reactions involve chemical changes in matter resulting in new substances
- Reactions involve rearrangement and exchange of atoms to produce new molecules
 - Elements are not transmuted during a reaction

Chemical Equations



- CH_4 and O_2 are the reactants, and CO_2 and H_2O are the products
- the (g) after the formulas tells us the state of the chemical
- the number in front of each substance tells us the numbers of those molecules in the reaction
 - called the coefficients

Balancing chemical equations

- Step 1: Determine the state of the reactants and products in the chemical reaction
- Step 2: Write the unbalanced chemical equation
- Step 3: Balance the number of atoms of each element in the reactant and product side, starting with the most complicated molecule

Balancing a Hypothetical Chemical Equation



- In this hypothetical reaction, C and D are the reactants, and X and Y are the products
- The number in front of each substance tells us the numbers of those molecules of reactants and products in the reaction
- So, if you react exactly 3 moles of C with 2 moles of D, then you will produce 5 moles of X and 2 moles of Y.
- If you reacted 6 moles of C with 4 moles of D, you will produce 10 moles of X and 4 moles of Y.

Example: Balancing chemical equations

- Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) reacts with Oxygen gas to produce gaseous carbon dioxide and water vapor



Reactants

6 C

12 H

6 O

Products

1 C

2 H

3 O

Chapter 4 Solutions Manual Chemistry

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