



Chemistry

Name: _____

Section _____ EQUATION INTRO NOTES KEY Date: _____

Introduction to Chemical Equations Key

Five indications of a chemical reaction

1. Heat or light evolved

Example: Tirrill burner flame: $\text{CH}_4(\text{g}) + 2 \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2 \text{H}_2\text{O}(\text{g})$

2. Gas evolved (bubbles form)

Example: $\text{NaHCO}_3(\text{s}) + \text{HC}_2\text{H}_3\text{O}_2(\text{aq}) \rightarrow \text{Na C}_2\text{H}_3\text{O}_2(\text{aq}) + \text{CO}_2\uparrow(\text{g}) + 2 \text{H}_2\text{O}(\text{l})$

3. Precipitate forms

Example: $\text{Pb}(\text{NO}_3)_2(\text{aq}) + \text{NaCrO}_4(\text{aq}) \rightarrow 2 \text{NaNO}_3(\text{aq}) + \text{PbCrO}_4\downarrow(\text{s})$

4. Color change

Example: $\text{CuO}(\text{s}) + \text{H}_2(\text{g}) \rightarrow \text{Cu}(\text{s}) + \text{H}_2\text{O}(\text{g})$

5. Odor change

Example: $\text{C}_5\text{H}_{11}\text{NO}_2\text{S}(\text{s}) \rightarrow \text{H}_2\text{S}(\text{g}) + (\text{numerous other products})$

Representing chemical reactions

Chemical reactions are represented by Writing a chemical equation

Chemical equations Use a right arrow (\rightarrow) instead of an equal sign as in math

Reactants or starting materials appear on the left side of the arrow

Products or the new substances formed appear on the right side of the arrow

Example: Reactant 1 + Reactant 2 \rightarrow Product 1 + Product 2

Steps for writing a chemical equation from a sentence

1. Word Equation

Example: sodium + water → hydrogen + sodium hydroxide

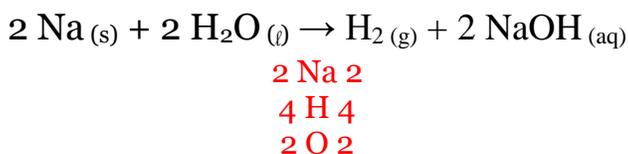
2. Formula (or Skeleton) Equation

Example: Na_(s) + H₂O_(l) → H₂_(g) + NaOH_(aq)

3. Balanced Equation

Example: 2 Na_(s) + 2 H₂O_(l) → H₂_(g) + 2 NaOH_(aq)

4. Check your work using atom tracking



Significance of chemical equations

1. Coefficients show the relative amounts of reactants and products

2. Relative masses can be obtained by using atomic mass from the Periodic Table

3. The reaction can be written backwards to obtain the reverse reaction

Chemical equations do *not* tell

1. Absolute mass used in an actual lab are not shown

2. Energy amounts are not shown (thermodynamics)

3. Spontaneity is not indicated

4. Reaction speed is not shown

5. The reaction mechanism or pathway is not shown