

CHEMICAL REACTIONS: An Introduction.

Importance of chemical reactions and formal descriptions of chemical reactions.

Evidence for a chemical reaction

Balancing Chemical Reactions.

Homework Problems:

6.2: 7, 8, 9, 13, 14, 19, 20

6.3: 37, 38, 43

CHEMICAL REACTIONS:

Importance of chemical reactions and formal descriptions of chemical reactions.

CHEMISTRY IS ABOUT MATTER AND THE INTERACTIONS BETWEEN MATTER.

CHEMICAL REACTIONS ARE ALL AROUND US.

- Rusting metal
- Candle burning
- Hair “perming”
- Burning natural gas
- Bread making
- Automobile fuel consumption
- You hearing my voice
- Hand waving

TO UNDERSTAND AND DISSECT CHEMICAL REACTIONS,

WE NEED FORMAL WAYS OF REPRESENTING REACTIONS

EVIDENCE FOR A CHEMICAL REACTION

Burning of natural gas

Flame

Heat

Smell

Moisture

Typical gross clues of chemical reactions

1. The color changes
2. Physical form changes
3. Bubbles form
- 4 Heat is produced or is absorbed

Modern sensitive techniques

Calorimetry, Spectroscopy, Mass changes of some species, Pressure changes, Changes in interactions with other matter, etc.

CHEMICAL EQUATIONS

- *Recognition of reactants and products
- *Balancing the chemical equation
- *Expressing physical state of molecules

Burning of natural gas

CHEMICAL REACTION:

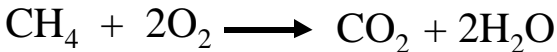


CHEMICAL CHANGE INVOLVING REARRANGEMENT OF GROUPS OF ATOMS.



IN A CHEMICAL REACTIONS ATOMS ARE NEITHER CREATED NOR DESTROYED.

BALANCING A CHEMICAL EQUATION:

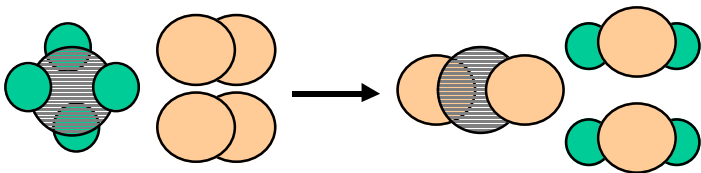
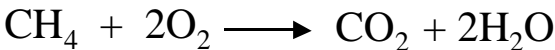
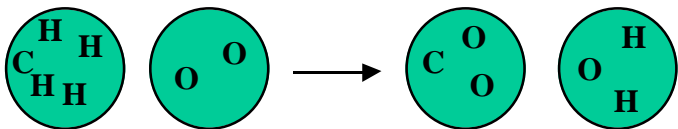


CHEMICAL EQUATIONS

*Recognition of reactants and products

*Balancing the chemical equation

Burning of natural gas



CHEMICAL EQUATIONS

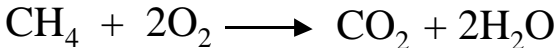
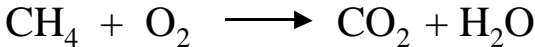
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Burning of natural gas

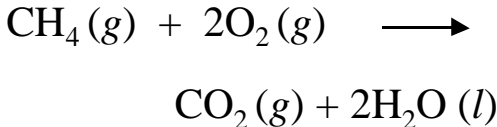
CHEMICAL REACTION:



BALANCING A CHEMICAL EQUATION:



EXPRESSING PHYSICAL STATES OF REACTANTS AND PRODUCTS:



HOW TO WRITE AND BALANCE EQUATIONS

1. Carefully read the description of the reaction. Know names of reactants from products.
2. Write the appropriate formulas for reactants and products.
3. Write a preliminary unbalanced equation that restates 1.
4. Balance the equation by inspection, starting with the most complicated molecule. Proceed element by element to determine what coefficients are necessary. Ultimately, the same number of each type of atom should appear on both the reactant side and the product side.

*Do not change the identities of reactants and products

*An atom may be present as an element, a compound, or an ion

*Coefficients used must give the smallest integers to give a balanced equation

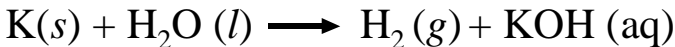
CHEMICAL EQUATIONS

Solid potassium reacts with liquid water. The products are gaseous hydrogen and potassium hydroxide dissolved in the water

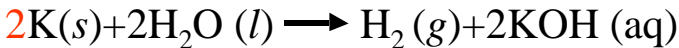
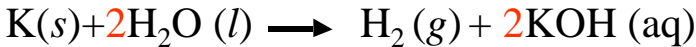
IDENTIFY REACTANTS AND PRODUCTS:

Potassium + water \longrightarrow Hydrogen + Potassium hydroxide
Reactants Products

WRITE FORMULAS FOR REACTANTS AND PRODUCTS:



BALANCING A CHEMICAL EQUATION:



CHEMICAL EQUATIONS

Etching silicon dioxide glass with hydrofluoric acid releases silicon tetrafluoride gas and liquid water.

IDENTIFY REACTANTS AND PRODUCTS:

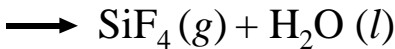
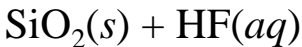
Silicon dioxide + hydrogen fluoride



Reactants

Products

WRITE FORMULAS FOR REACTANTS AND PRODUCTS:



BALANCING A CHEMICAL EQUATION:

