Name Key Date Section

Chemistry-Part 3 Notes

Chemical Reactions & Equations

Chemical Reactions:

- Occur when bonds between the outermost parts of atoms are formed or broken.
- Involve changes in matter, the making of new materials with new properties, and energy changes.
- Symbols represent elements, formulas describe compounds, and chemical equations describe a chemical reaction.

Parts of a Chemical Equation:

- Show the conversion of reactants (the molecules put into a reaction, on the left side of the arrow) into products (the molecules produced by the reaction, on the right side of the arrow).
- A plus (+) sign separates molecules on the same side.
- The arrow is read as yields.

Ex: $C + O_2 \rightarrow CO_2$ is read as:
Carbon plus oxygen react to yield carbon dioxide.

- Symbols used in equations include: Solid (s), Aqueous Solution (aq), Liquid (l), Gas (g)
- Subscripts vs. Coefficients:

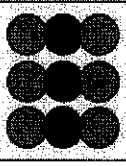
The subscript tell you how many atoms of a particular element are in a compound.

The coefficient tells you about the quantity, or number of molecules in the compound.

CO_2 → subscript

1 - C atom

2 - O atoms

C	means		One atom of carbon
O	means		One atom of oxygen
O_2	means		One molecule of oxygen consisting of two atoms of oxygen
CO	means		One molecule of carbon monoxide consisting of one atom of carbon attached to one atom of oxygen
CO_2	means		One molecule of carbon dioxide consisting of one atom of carbon attached to two atoms of oxygen
3 CO_2	means		Three molecules of carbon dioxide, each consisting of one atom of carbon attached to two atoms of oxygen

$2CO_2$ → coefficient

2 - C atoms

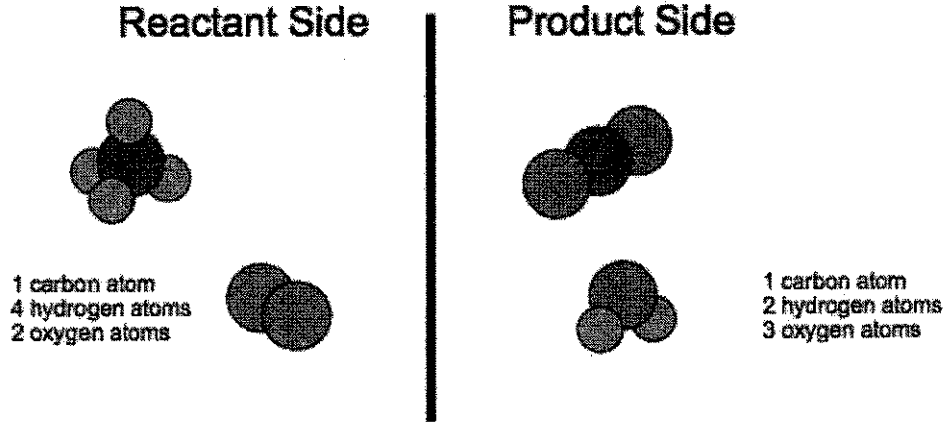
4 - O atoms

Balancing Chemical Equations:

- In a chemical reaction, matter is neither created nor destroyed.
- The number and type of atoms going into a reaction must be the same as the number and types of atoms coming out
- If the equation obeys the Law of Conservation of Mass, it is balanced.

An Unbalanced Equation:

$CH_4 + O_2 \rightarrow CO_2 + H_2O$

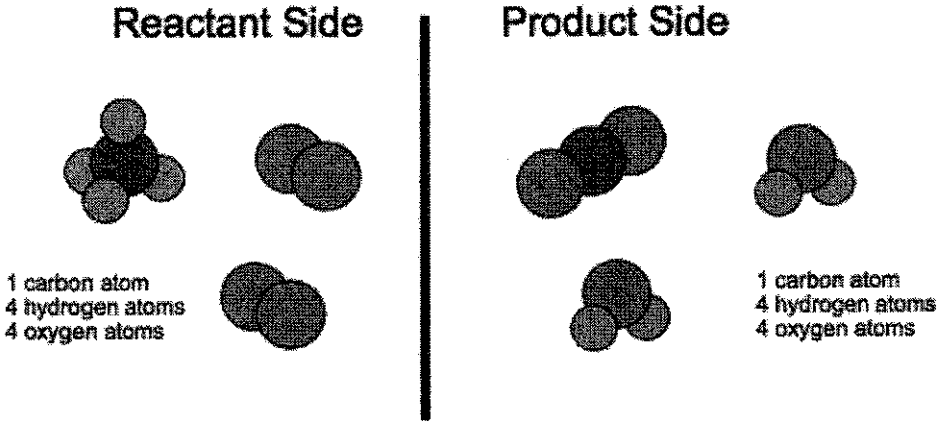


1.) Do initial atom count on both reactant & product side.

2.) Balance atoms by changing coefficients only

Balanced Equation:

$1\ CH_4 + 2\ O_2 \rightarrow 1\ CO_2 + 2\ H_2O$



Examples:

$2\ KClO_3 \rightarrow 2\ KCl + 3\ O_2$

$2\ C_2H_6 + 7\ O_2 \rightarrow 4\ CO_2 + 6\ H_2O$