Balancing Equations Notes

Background Info

Diatomic Elements- Elements that exist in pairs when not bonded to any other different element.

BrINClHOF

Br_2 I_2 N_2 Cl_2 H_2 O_2 F_2

Acids

Hydrochloric Acid- HCl	Sulfuric Acid- H_2SO_4
Nitric Acid- HNO_3	Phosphoric Acid H_3PO_4
Acetic Acid- $HC_2H_3O_2$	Carbonic Acid- H_2CO_3

Balanced Chemical Equations

1. Word Equation

Zinc added to hydrochloric acid yields zinc chloride and hydrogen gas

Zinc + hydrochloric acid → zinc chloride + hydrogen gas

Reactants Products

2. Unbalanced Equation

-Correctly write chemical formulas:

$Zn + HCl \rightarrow Zn Cl_2 + H_2$

1atom Zn	1 atom Zn
1 atom H	2 atom H
1 atom Cl	2 atom Cl

- Never change subscripts of correctly written formulas.

-Violates law of Conservation of Matter

3. Balanced Chemical Equation

- Both sides of the equation must have the same number of atoms of each element.
- To balance the equation, add coefficients in front of correctly written formulas.

$Zn + HCl \rightarrow Zn Cl_2 + H_2$

1 atom Zn	1 atom Zn
1 atom H	2 atom H
1 atom Cl	2 atom Cl

$Zn + \mathbf{2}HCl \rightarrow Zn Cl_2 + H_2$

1atom Zn	1 atom Zn
2 atom H	2 atom H
2 atom Cl	2 atom Cl

Writing word equations procedure

1. Identify the ions. (Use ion sheets)
2. Write the correct chemical formulas for all reactants and products.
3. Count atoms of each type on each side. If a polyatomic ion appears on both sides, treat it as a single unit.
4. Start with the elements that appear only once and then move on to others. Other elements that appear several times will balance themselves out.
5. Place coefficients in front of compounds and/or free elements as necessary.