

Balancing Chemical Equations

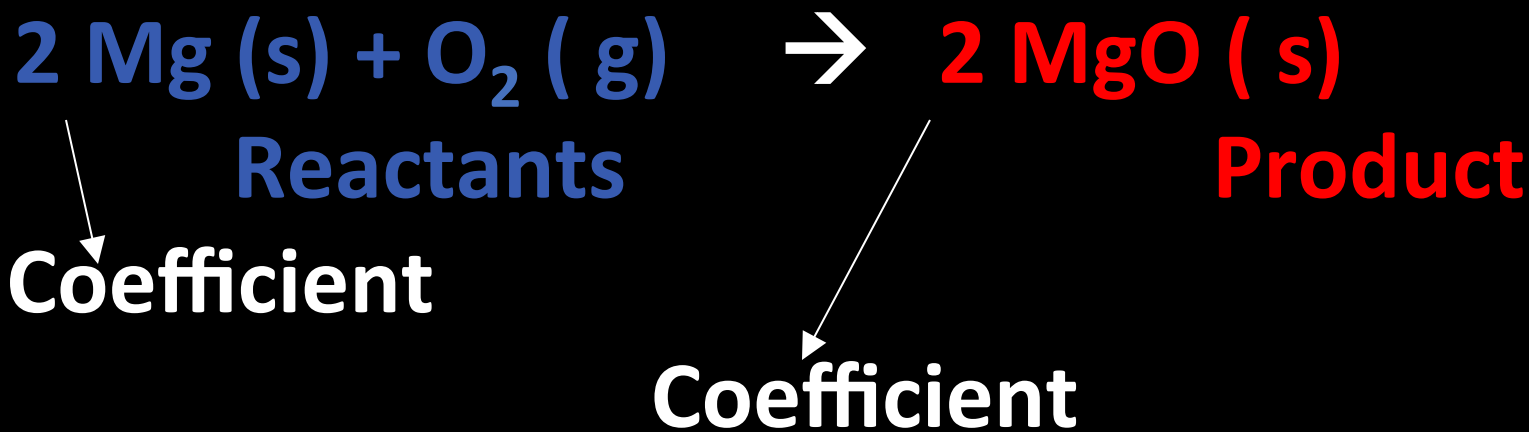
Chemical Equations

- ▣ A way to represent a chemical reaction on paper.

Reactants → Products

“→” means “yields” or “reacts to produce”.
It separates reactants from products

“+” Separates individual reactants and
individual products from one another



Equations must be balanced:

- Atoms can be neither created nor destroyed by ordinary chemical means
 - (Law of conservation of matter)
- So we must have the same number of each type of atoms on each side of the equation (arrow)

Balancing Chemical Equations:

- 1. Balance metals**
- 2. Balance nonmetals**
- 3. Balance oxygen**
- 4. Balance hydrogen**
- 5. Recheck all atoms**
- 6. If EVERY coefficient will reduce, rewrite the whole equation using the simplest ratio of coefficients.**

Signs of Chemical Rxns:

- **Gas formation**
- **Solid formation (Precipitate)**
- **Color Change**
- **Light or sound given off**
- **Heat absorbed or given off
(temperature changes)**

Practice Balancing Equations

- $\text{CO} + \text{Fe}_3\text{O}_4 \rightarrow \text{FeO} + \text{CO}_2$
- $\text{Nb} + \text{Cl} \rightarrow \text{NbCl}_5$
- $\text{ZnCO}_3 + \text{HNO}_3 \rightarrow \text{Zn}(\text{NO}_3)_2 + \text{CO}_2 + \text{H}_2\text{O}$

Combustion (Burning)

- Combustion is the reaction of a hydrocarbon with oxygen to produce carbon dioxide (CO_2) and water (H_2O)
- $\text{CH}_4 + \text{O}_2 \rightarrow$
- $\text{C}_2\text{H}_2 + \text{O}_2 \rightarrow$
- $\text{C}_4\text{H}_{10} + \text{O}_2 \rightarrow$
- $\text{C}_5\text{H}_{10} + \text{O}_2 \rightarrow$
- $\text{C}_2\text{H}_5\text{OH} + \text{O}_2 \rightarrow$