Success 24/7 Chemistry: Balancing Chemical Equations Notes

Decoding Chemical Equations

A chemical equation is a representation of a chemical reaction.

A chemical reaction is the changing of substances by the breaking of bonds in reactants and the formation of bonds in products.

What you need to know:

Reactants → Products

+	(aq)
→	↔
(s)	N.R.
(l)	Δ
(g)	catalyst

(Δ (light or heat) & catalysts are written above the yield sign)

$$CH_4\,(g) + 2O_2\,(g) \xrightarrow{\Delta} CO_2\,(g) + 2\,H_2O\,(g)$$

$$H_2O_2\,(l) \xrightarrow{KI} H_2O\,(l) + O_2\,(g)$$

Balancing Chemical Equations

What is a balanced equation?

# of atoms of each element in reactants = # of atoms of each element in products

Why do we do this?

To follow the Law of Conservation of Mass (mass cannot be created nor destroyed…).

Basically, what is in the beginning of the reaction must be present once the reaction is over.

How do we do this?

- Use pencil
- Look at elements one at a time
- If there is a polyatomic ion that appears on both sides of the chemical equation, treat it as one unit.
- Balance H & O last. (The one that is in the most spots should be the last one balanced.)
- Practice…a lot!

Practice time!

1) ____ P_4 + ____ O_2 → ____ P_2O_3

2) ____ MgF_2 + ____ Li_2CO_3 → ____ $MgCO_3$ + ____ LiF

3) ____ Na_3PO_4 + ____ KOH → ____ NaOH + ____ K_3PO_4

4) ____ $RbNO_3$ + ____ BeF_2 → ____ $Be(NO_3)_2$ + ____ RbF

5) ____ $AgNO_3$ + ____ Cu → ____ $Cu(NO_3)_2$ + ____ Ag

6) ____ CF_4 + ____ Br_2 → ____ CBr_4 + ____ F_2

7) ____ HCN + ____ $CuSO_4$ → ____ H_2SO_4 + ____ $Cu(CN)_2$

8) ____ GaF_3 + ____ Cs → ____ CsF + ____ Ga

9) ____ BaS + ____ PtF_2 → ____ BaF_2 + ____ PtS

"Increased Difficulty" Practice!

1) _____CO + _____Fe_2O_3 → _____Fe + _____CO_2

2) _____C_5H_{14} + _____O_2 → _____CO_2 + ____H_2O

3) ___C_2H_5OH + ___O_2 → ___CO_2 + ___H_2O