

## Warm Up:

1. Iron (III) chloride
2. Sulfur trioxide
3.  $Al(NO_3)_3$
4.  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
5.  $O_2 + 2H_2 \rightarrow 2H_2O$

## Periodic Table Tips

Charges for...

- Group 1 (Alkali Metals): +1
- Group 2 (Alkaline Earth Metals): +2
- Groups 3-12 (Transition Metals): Most of these are multivalent. You can tell what the charge is by looking at the name or formula of the compound.
- Group 13: +3
- Group 14: +4 or -4
- Group 15: -3
- Group 16: -2
- Group 17 (Halogens): -1
- Group 18 (Noble Gases): 0

Diatomic Molecules

- "H-7 Rule" or "Rule of 7" ( $H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2$ )
- Also:  $P_4, S_8$

## Naming...

## 1. Ionic Compounds (metal &amp; non-metal)

- Write the name of the metal first
- Write the name of the non-metal second and change the ending to "ide"
- If the metal has 2 or more charges (ie. transition metals), include a roman numeral to indicate which one it is
- When naming ionic compounds with polyatomic ions, pretend the polyatomic ion is just one atom and following the same rules
- Examples
  - $MgF_2$  magnesium fluoride
  - $CuCl_2$  copper (II) chloride
  - $KPO_4$  potassium phosphate

## 2. Covalent Compounds (2 non-metals)

- Write the name of the first non-metal
- Write the name of the second non-metal and change the ending to "ide"
- Use numerical prefixes to express how many of each non-metal are present
  - You do not use a prefix when there is only one of the first non-metal
- Example:
  - $SO_2$  sulfur dioxide
  - $Si_3N_4$  trisilicon tetranitride

## Formulas...

### 1. Ionic Compounds

- Add subscripts so that the positive charges balance the negative charges (“drop and swap” or “criss-cross”)
- If the metal has more than one charge, the charge will be indicated by the roman numeral
- When writing formulas of ionic compounds with polyatomic ions, pretend the polyatomic ion is just one atom and follow the same rules
- Examples:
  - Magnesium phosphide  $Mg_3P_2$
  - Iron (III) sulfide  $Fe_2S_3$
  - Calcium carbonate  $CaCO_3$

### 2. Covalent Compounds

- The prefixes indicate how many of each non-metal are present
- Examples:
  - Phosphorus trioxide  $PO_3$
  - Dinitrogen pentacarbide  $N_2C_5$

## Acids, Bases & Salts

- Acids:
  - Formulas usually start with H
  - Example:  $HCl$ ,  $CH_3COOH$
- Bases
  - Formulas usually end with OH
  - Example:  $NaOH$ ,  $Mg(OH)_2$
- Salts
  - Salts are ionic compounds (metal and non-metal)
  - Example:  $NaCl$ ,  $LiBr$

## Types of Reactions

Type	General Formula	Example
1. Synthesis	$A + B \rightarrow AB$	$2Na + Cl_2 \rightarrow 2NaCl$
2. Decomposition	$AB \rightarrow A + B$	$2H_2O \rightarrow 2H_2 + O_2$
3. Single Replacement	$AB + C \rightarrow AC + B$ (where C is a non-metal)	$2NaCl + Br_2 \rightarrow 2NaBr + Cl_2$
4. Double Replacement	$AB + CD \rightarrow AD + CB$	$2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$
5. Neutralization	Acid + Base $\rightarrow$ water + salt	$HCl + NaOH \rightarrow H_2O + NaCl$
6. Combustion	Hydrocarbon + $O_2 \rightarrow H_2O + CO_2$	$CH_4 + 2O_2 \rightarrow 2H_2O + CO_2$

## Practice: Science 10 Chemistry Review