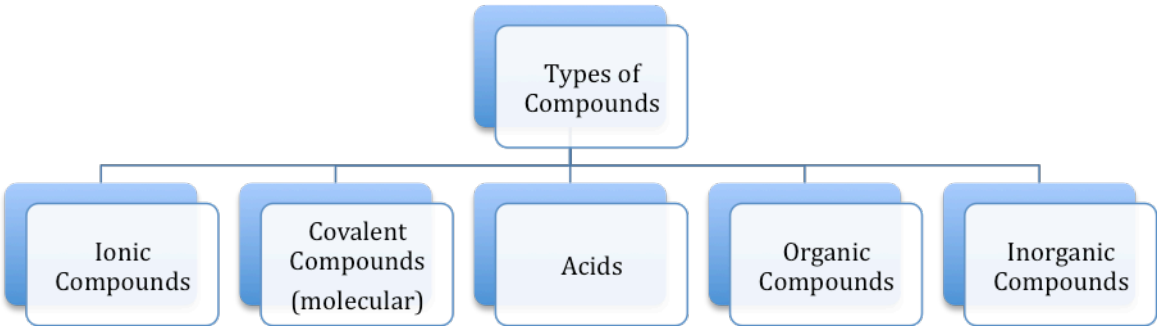
Chemistry Guided Notes
Unit 2: Formula Writing

Name: _____
Date: _____ Period: _____

Parts of a Chemical Formula

- Chemical Formula- _____
  - Chemical Symbol
    - Letters
    - _____
    - _____
  - Subscripts
    - Small numbers to the lower right of the chemical symbol
    - _____
    - No subscript means _____
  - Parentheses
    - When present, subscripts on the outside multiply by all the subscripts on the inside to determine the _____
- Examples:
  - H_2SO_4
    - What elements are present in the compound? _____
    - How many atoms of each element are present in the compound? _____
    - What is the ratio of atoms of elements in the compound? _____
  - $Mg(OH)_2$
    - What elements are present in the compound? _____
    - How many atoms of each element are present in the compound? _____
    - What is the ratio of atoms of elements in the compound? _____

Types of Compounds

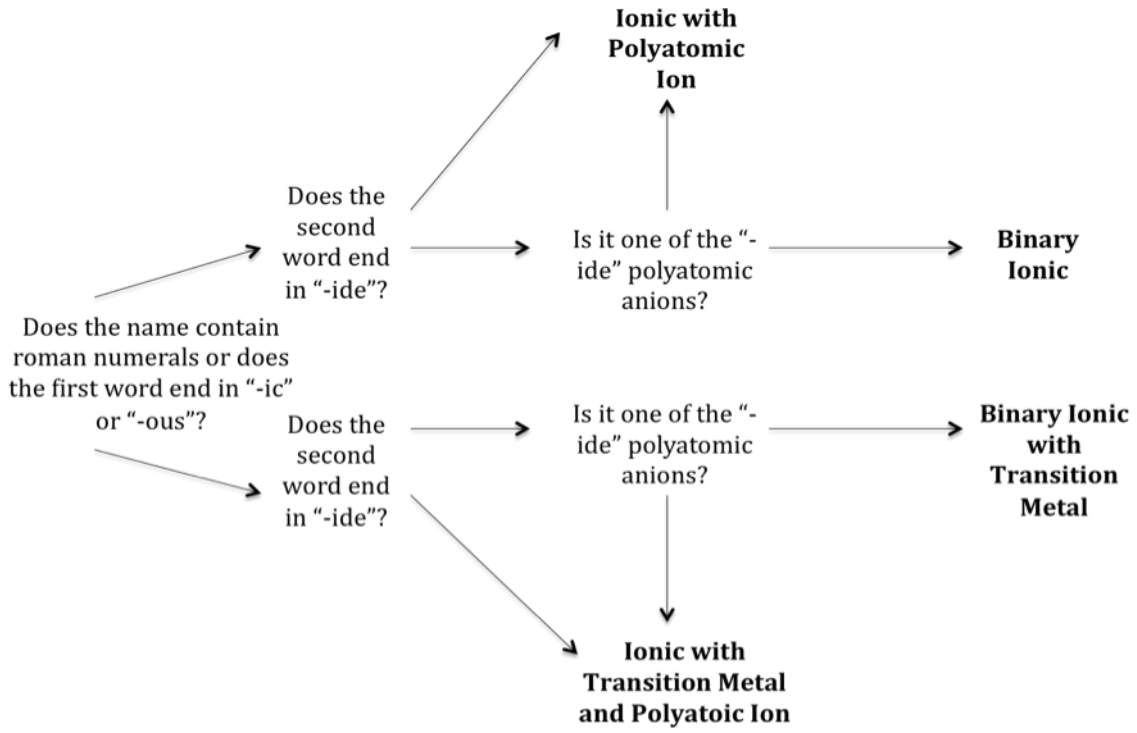


Ionic Compounds

- ❖ Ions
  - Ions are _____
    - Cation- _____
      - Always a _____ or _____
    - Anions- _____
  - Oxidation Number- _____
  - Polyatomic ions- ions that _____
- ❖ Properties of Ionic Compounds
  - Contain Ionic Bonds
    - Result from a _____ of electrons
    - Bond between a positive _____and a negative _____
  - Composed of a _____ and a _____ (or metal+ multiple nonmetals)
    - Exception: Compounds that contain ammonium (NH_4) do not contain metals but are ionic
  - _____(ex. trinitrogen dioxide)
  - _____
  - _____
  - _____
  - _____
  - _____

Writing Formulas for Ionic Compounds

- ❖ Determining the Type of Ionic Compound from the Name



- Identify the Type of Compound:
    1. Potassium Carbonate _____
    2. Sodium Chloride _____
    3. Iron (III) Oxide _____
    4. Manganese (III) Carbonate _____
    5. Cupric Chloride _____
    6. Magnesium Phosphate _____
    7. Ferric Sulfate _____
    8. Sodium Oxide _____

❖ Binary Ionic
- Definition- _____
- Writing Formula
    - _____
    - _____
        - _____
    - _____
        - _____
        - _____
- Examples
    - Sodium Chloride _____
    - Sodium Oxide _____

❖ Binary Ionic with Transition Metal
- Definition- _____
- Writing Formula
    - Write both symbols
    - Write oxidation numbers
        - _____
        - _____
    - Crisscross oxidation numbers to find subscripts
        - Reduce if possible
        - Don't write if subscript is one
- Examples:
    - Iron (III) oxide _____
    - Cupric chloride _____

❖ Ionic with Polyatomic Ion

- Definition- _____
- Writing Formula
  - Write both symbols
  - Write oxidation numbers
    - _____
    - _____
  - Crisscross oxidation numbers to find subscripts
    - _____

      _____
    - Reduce if possible
    - Don't write if subscript is one
- Examples
  - Potassium Carbonate _____
  - Magnesium Phosphate _____

❖ Ionic with Transition Metal and Polyatomic Ion

- Definition- _____
- Writing Formula
  - Write both symbols
  - Write oxidation numbers
    - _____

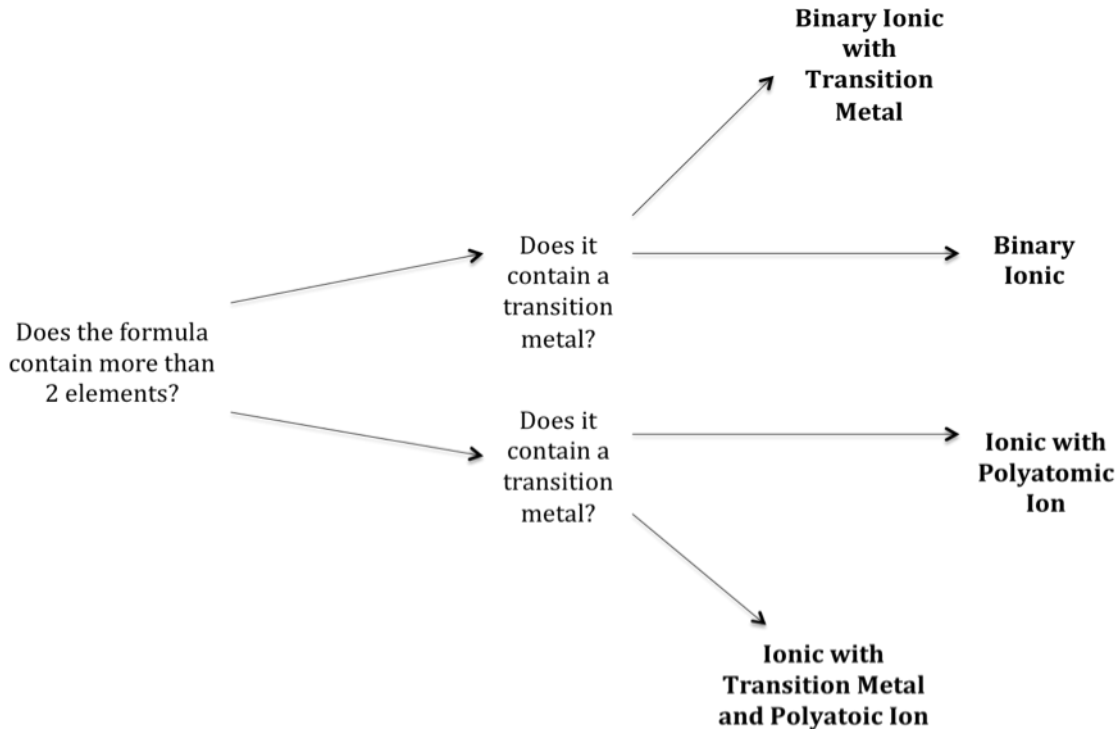
      _____
    - _____
  - Crisscross oxidation numbers to find subscripts
    - _____

      _____
    - Reduce if possible
    - Don't write if subscript is one
- Examples
  - Manganese (III) Carbonate _____
  - Ferric Sulfate _____

- ❖ Ammonium Exception
  - If ammonium is in the compound
    - _____
    - _____
    - _____
    - Examples:
      - Ammonium Chloride _____
      - Ammonium Carbonate _____

<u>Naming Ionic Compounds</u>

- ❖ Determining the Type of Ionic Compound from the Formula



- Identify the Type of Ionic Compound
  1. $Mg(OH)_2$ _____
  2. Li_2O _____
  3. $FeCl_3$ _____
  4. $Pb(NO_3)_2$ _____
  5. NaF _____
  6. $Sr(NO_3)_2$ _____
  7. Cu_2SO_4 _____
  8. $CuCl_2$ _____

- ❖ Binary Ionic

- Naming
  - _____
  - _____
- Examples
  - Li_2O _____
  - NaF _____

❖ Binary Ionic with Transition Metal

- Naming
  - _____
  - _____
  - _____
  - _____
- Examples
  - $FeCl_3$ _____
  - $CuCl_2$ _____

❖ Ionic with Polyatomic Ion

- Naming
  - Write the name of the metal
  - Write the name of the polyatomic ion
  - _____
- Examples
  - $Mg(OH)_2$ _____
  - $Sr(NO_3)_2$ _____

❖ Ionic with Transition Metal and Polyatomic Ion

- Naming
  - Determine the oxidation number of the transition metal (reverse crisscross)
  - Write the name of the transition metal
  - Write the oxidation number in roman numerals in parentheses
  - Write the name of the polyatomic ion
  - DO NOT CHANGE THE ENDING
- Examples
  - Cu_2SO_4 _____
  - $Pb(NO_3)_2$ _____

❖ Ammonium Exception

- Ammonium, NH_4 will be the first thing in the compound
- _____
- For the anion
  - If it is a nonmetal _____
  - If it is a polyatomic ion _____
- Examples
  - NH_4Cl _____
  - NH_4OH _____

Covalent Compounds

❖ Properties of Covalent Compounds
- Also called _____
- Contain covalent bonds
  - Result from a _____ of electrons
  - Contain _____
  - _____
  - Two kinds
    - Nonpolar: _____
    - Polar: _____
  - _____
  - _____
  - _____
  - _____
  - _____

❖ Naming Covalent Compounds
- First Element
  - _____
  - _____
  - _____
- Second Element
  - _____
  - _____
  - _____
- Examples
  - H_2O _____
  - N_2O_3 _____
  - SO_3 _____

Greek Numeric Prefixes	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

- CCl_4 _____

❖ Writing Formulas for Covalent Compounds

- First Element
  - Write the symbol
  - _____
- Second Element
  - Write the symbol
  - Write the subscript that corresponds to the prefix
- Examples:
  - Nitrogen Trichloride _____
  - Carbon Tetraflouride _____

<u>Acids</u>

❖ Properties of Acids

- All contain _____ as the first element
- React with _____ to form _____
- Corrosive- _____
- _____
- Usually _____ at room temperature
- Can be _____ or _____
- pH value _____

❖ Two Kinds

- Binary Acids _____
- Oxyacids _____

<u>Naming Acids</u>

❖ Binary Acids

- Add the prefix _____
- Change the ending to _____
- Add the word _____
- Examples
  - HF _____
  - H_2S _____

❖ Oxyacids

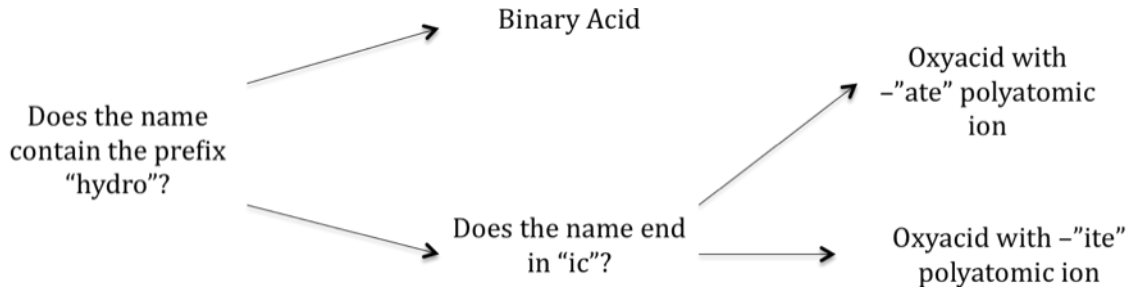
- Catch Phrase: _____

  _____

- If the acid contains an "-ate" polyatomic ion
  - _____
  - Add the word acid
- If the acid contains an "-ite" polyatomic ion
  - _____
  - Add the word acid
- Examples
  - HNO_3 _____
  - HNO_2 _____

Writing Formulas for Acids

❖ Determine the kind of acid



- Write symbols _____
- Write _____
- _____

❖ Examples

- Hydrochloric acid _____
- Phosphorous acid _____
- Phosphoric acid _____

Organic vs. Inorganic Compounds

- Organic Compounds
  - _____
    - There are a few compound that contain carbon that are not organic (_____ _____)
  - _____
  - Other elements often found in organic compounds include _____
  - All organic compounds are _____
- Inorganic Compounds
  - _____ (with the exception of those listed above)
  - Contain atoms of _____
  - Include _____

- Properties of Organic and Inorganic Compounds

	Organic	**Inorganic**
Flammability		
Solubility in Water		
Melting Points		
Conductivity		

- Hydrocarbons
  - _____
  - _____
  - _____
  - Alkanes
    - _____
    - To remember the first four _____

ALKANES			
CH_4		C_6H_{14}	
C_2H_6		C_7H_{16}	
C_3H_8		C_8H_{18}	
C_4H_{10}		C_9H_{20}	
C_5H_{12}		$C_{10}H_{22}$	