Unit 3 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemical Equations Date \_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_

& Stoichiometry

Unit 3B – Chemical Equations

### Knowledge/Understanding Goals:

* Conservation of Matter and Molar Ratios

### Skills:

1. Write a proper chemical equation if given the chemical names.
2. Balance any chemical equation.
3. Identify the molar ratio between any reactants/products

### Notes:

Chemical Equations:

The equation provides the molar (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) relationship between all of the reagents/products involved in the reaction with ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***, the ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** of all reactants and products, and the proper ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** for all reactants/products.

* i.e.:

**Reagents:**

**Products:**

**Yields/Produces:**

Conservation of Matter:

* Recall that, during a chemical reaction, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the atoms involved in the reaction ***do not change***! Only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are taken, given or shared.
  + i.e.:
* This means

Balancing:

**Coefficients:**

* They are the only way to change the number of atoms on each side of the equation. You ***cannot*** change any \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, as this will change the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and thus the molecule involved in the reaction.

Tips for Balancing

Phases:

* Elements’ phases can be determined from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Black =
  + Red =
  + Blue =
* Molecules’ phases must be determined via a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or from hints in the description of each reagent/product.
  + All solutions (acids, bases, salt solutions) are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + There are very few instances where a pure liquid will be used. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the most common liquid \_\_\_\_.
  + A precipitate or crystal is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + **Ionic** compound solubility
    - You are not expected to memorize all of the solubility rules, but here are the common ones you should be familiar with.

|  |  |
| --- | --- |
| Soluble | Insoluble |
| * All alkali cations and ammonium (NH4+) * All nitrates (NO3-), acetates (C2H3O2-), chlorates (ClO3-), and perchlorates (ClO4-) * All\* chloride (Cl-), bromide (Br-) and iodide (I-) anions * Sulfate (SO42-)\*\* | * All\* carbonates (CO32-), oxides (O2-), silicates (SiO32-), chromates (CrO42-), sulfites (SO32-) and phosphates (PO43-) * Hydroxides (OH-)\*\* * Sulfides (S2-)\*\*\* * Fluoride (F-)\* |
| \*(except with Ag+, Hg2+, and Pb2+)  \*\* (except with Ag+, Hg2+, Pb2+, and heavy alkalines Ca, Sr, Ba) | \*(except with alkali metals & NH4+)  \*\*(except with alkali and heavy alkalines Ca2+, Sr2+, Ba2+)  \*\*\*(except alkali and alkaline metals) |

Practice balancing and writing out full equations!