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

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

& Stoichiometry

Unit 3A - Moles

### Knowledge/Understanding Goals:

* moles, molar mass

### Skills:

* determine the molar mass of any compound

###  Notes:

The Mole

mole (working definition):

Remember, the mole is just a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. You can have 1 mole of anything just like you can have a dozen of anything. It all depends on what you are trying to quantify…

1 mole =  atoms, molecules, particles, formula units, *etc.*

Moles are useful because:

Remember the trick for converting between molecules, moles, and grams?

Molar Mass

The molar mass of a compound is the mass of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Molar mass is the \_\_\_\_\_\_\_\_\_\_\_\_\_ of the molar masses of the atoms that make up the compound.

For example, the molar mass of ZnCl2 is the molar mass of:

*
* which adds up to

\*\*\*Notice its good practice to carry over decimals for molar mass to the hundredths place\*\*\*

This molar mass value is in itself a ratio (g/mol) and therefore can be used as a conversion factor.

* or

If you have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (a compound that attracts and absorbs water) the molar mass includes the water bound to the hydrate. For example, the molar mass of iron (III) chloride hexahydrate (FeCl3∙6 H2O) is the molar mass of:

Mole Calculations

Remember that you can calculate the number of moles in several different ways:

1. If you are working with a \_\_\_\_\_\_\_\_\_\_\_\_ of known mass (g), use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mol) as a conversion factor:

Suppose you have 30.0 g of NaCl:

1. If the substance is a \_\_\_\_\_\_\_\_\_, use *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*:

Suppose P = 1.10 atm, V = 25.0 L, and T = 298 K:

1. If you are working with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of known volume (L), use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (mol/L) as a conversion factor:

Suppose you have 125 mL of a 2.25*M*  solution:

***\*\*\*Make sure your units match before trying to apply a conversion factor! Especially when dealing with a volume (mL vs L), pressure (atm vs bar), or temperature (⁰C vs K)\*\*\****