

# BIG CHEM BLITZ UNIT 5, The Mole

PRINT NAME \_\_\_\_\_ Period \_\_\_\_\_

## \*\*\* SHOW METHOD OF SOLUTION FOR ALL PROBLEMS (The 1,2,3,4!)

**Hints:** Concentration:  $M = \text{mol/L}$   $L = \text{ml}/1000\text{ml/L}$

**Grams of solute:**  $g = (M)(MM)(L)$

**Percentage Composition:**

- Find the total mass, *the MM*.
- Divide each Unit element's mass by the total to get the percentage.

**Empirical Formula** is the simplest mole ratio.

- Get moles of each Unit element.
- Divide each Unit result by the smallest number of moles to get the simplest ratio.
- If you get a half-a-mole, *Double All*.
- Write the empirical (simplest formula).

**Molecular Formula** (actual formula):

- Get the Empirical Formula.
- Find the MM of the Empirical Formula.
- Divide the actual MM by the empirical MM to get the ratio.
- Multiply the Empirical Formula by the ratio to get the actual formula.

**Water of Hydration:**

- Get moles of the Salt & the Water.
- Divide  $\text{mol H}_2\text{O}/\text{mol salt} = \text{a ratio}$ .
- Place the ratio as  $\text{Salt} \cdot \text{___ H}_2\text{O}$ .

**Finding the mass of an atom or molecule:**

Simply divide the MM of the atom or molecule by Avogadro's Number to divide up the MM by all of the particles sharing it. Watch out for your exponent's sign. It's a very small number of grams/atom or grams/molecule.

- Find the Molecular Mass of  $\text{KH}_2\text{PO}_4$ .
- Get moles in 76.0 g of  $\text{CaBr}_2$ .
- Find molarity (M) of a solution containing 45.1 g of  $\text{CoSO}_4$  in 250 ml of solution.
- How many grams of  $\text{Pb}(\text{OH})_2$  are needed to make 250 ml of 4.00 M solution?
- Find the percentage composition of  $\text{NiI}_2$ .
- Find the empirical formula of 1.67 g of Ce and 4.54 g of I.
- Find molecular formula for CH when its actual MM is 78 g/mol.
- Find formula of the hydrate having 95.3 g of  $\text{LiNO}_3$  and 74.7 g of  $\text{H}_2\text{O}$ .
- Calculate the mass of a single atom of Au.
- Calculate the mass of a single molecule of  $\text{H}_2\text{O}$ .

WHEN FINISHED:

- \*\* BE SURE YOUR PAPER IS HEADED PROPERLY.
- \*\* STAPLE YOUR PAPERS TOGETHER.
- \*\* PAPER CLIP THE EXAM ON TOP OF YOUR PAPERS.