CHM 110: EXPERIMENT 3A BASIC CALCULATIONS

* A MOLE (mol) is defined as 6.022×10^{23} particles.

* The mass (in grams) of a mole of atoms of an element is numerically equal to the element's ATOMIC WEIGHT.

> Example:
> 1 mol of Mg weighs 24.31 grams

* To change from mass to moles or moles to mass, use the atomic weight as a conversion factor.

> Example:
> Convert 1.50 g Mg to moles Mg.
>
> $$1\ \text{mol Mg} = 24.31\ \text{g Mg}$$
>
> $$1.50\ \text{g Mg} \times \frac{1\ \text{mol Mg}}{24.31\ \text{g Mg}} = 0.0617\ \text{mol Mg}$$

To find the EMPIRICAL FORMULA of magnesium oxide:

1) Find the MASS OF OXYGEN by subtraction.

$$\text{mass O} = \text{mass oxide} - \text{mass Mg}$$

2) Convert the MASS OF MAGNESIUM to MOLES

$$\text{mass Mg} \times \frac{1\ \text{mol Mg}}{24.31\ \text{g Mg}} = \text{mol Mg}$$

3) Convert the MASS OF OXYGEN to MOLES

$$\text{mass O} \times \frac{1\ \text{mol O}}{16.00\ \text{g O}} = \text{mol O}$$

4) The empirical formula contains the smallest whole number ratio of

$$\text{mol Mg} : \text{mol O}$$

> Hint: Divide both numbers of moles by the smaller number to start simplifying this ratio!