Summary of Mole Lab Calculations

1. Identify Elements by Weighing Samples of Each Unknown Vial

1. Calculate the mass of unknown element in each container.

mass of container + unknown
– mass written on empty container
Mass of unknown element (g)

2. Molar mass (atomic mass expressed as g/mol) = $\frac{\text{mass of unknown element (g)}}{\text{moles of element present (moles)}}$

3. Using a periodic table, locate an element in the table that has your calculated atomic mass. The element of that calculated atomic mass is your unknown element.

2. Determination of moles and formula units for NaCl and KNO_3

1. Determine mass of both the sodium chloride and potassium nitrate samples

mass of container + sample
– mass written on empty container
Mass of sample

2. Determine molar mass of NaCl and KNO_3 using atomic masses from the periodic table

3. Determine number of moles present

Sample mass (g) x $\frac{1 \text{ mole}}{\text{Molar mass (g)}}$ = # moles

Note: units of grams cancel and the resultant has units of moles

4. Use Avogadro's number (3 sig figs) to determine number of formula units

moles (from 3 immediately above) x $\frac{6.02 \times 10^{23} \text{ formula units}}{\text{mole}}$ = # formula units

Note: units of moles cancel and the resultant has units of formula units

3. Determination of the number of moles and molecules in 40.0 mL of water

1. Use the atomic masses of H and O from the periodic table to determine the molar mass of water
2. Determine moles of water from the mass of using #3 in part 2
3. Determine the number of molecules of water as in #4 in part 2

Note: Although both are calculated via Avogadro's number
We use formula units for ionic compounds (like NaCl or KNO_3)
We use number of molecules for molecular compounds (like H_2O)