Lab Exercise #1 - Measurement of Volumes and weights: Accuracy and Precision

1. Calculate the following:
   - **a)** The molecular weight of calcium chlorate, $Ca(ClO_3)_2$.
   - **b)** The moles of water in a 42 mL sample.
   - **c)** The moles of oxygen atoms in a 3.24 g sample of magnesium carbonate, $MgCO_3$.
   - **d)** The weight of 1.5 moles of ammonia, NH_3.
   - **e)** Concentration in mol/L of a solution containing 57 mg of sodium chloride is added to a 50 mL volumetric flask.
   - **f)** Concentration in mol/L of a solution containing 28 mg of calcium chloride is added to a 25 mL volumetric flask.
   - **g)** Concentration in mol/L of H^+ ions in a solution containing 1 mL of sulfuric acid (density of 1.83 g/cm^3) in a 25 mL volumetric flask.
2. What weight of potassium sulphate, K_2SO_4, is required to prepare 100 mL of a 0.15 M solution of potassium ions?
3. At an accuracy of two significant figures, what is the concentration of water in pure water?
4. What are the units of density?
5. The density of a 0.1 M of NaCl at 25°C is 1.00116 g/cm^{-3}. A student prepared a solution containing 28.9 mg NaCl in a 5 mL volumetric flask and measured the mass of 1 mL of that solution three times as follows: mass 1 = 1.001 g; mass 2 = 1.003 g; mass 3 = 0.999 g. The laboratory thermometer showed T = 24.5°C on the day of the experiment.
   - **a)** Calculate the density of this solution with its respective standard deviation and the proper significant figures.
   - **b)** Judge the measurements according to its precision and accuracy.
6. What is the WHIMS symbol for:
   - **a)** Flammable
   - **b)** Oxidizer
   - **c)** Explosive
   - **d)** Corrosive
   - **e)** Environmental Hazard